MINISTRY OF TRANSPORT
DEPARTMENT OF MARINE ADMINISTRATION
No-363/421, Corner of Merchant & Theinbyu Road, Botataung Township, Yangon, Myanmar

E-mail: dgdma.mm@gmail.com; dma.myan@gmail.com Tel: 095 -1- 397640

P.O.Box: 194 Fax: 095 -1- 397641

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Directive (11/2015)

National Requirements for Fishing Vessels of 24 meters in Length and above

Applicable to: Ship owners, Recognized Organizations, Shipping Companies, Flag State Surveyors

1. The Department of Marine Administration circulated this directive in the exercise of the power of Section 294(B), paragraph (b) of Myanmar Merchant Shipping Act.

2. Pursuant to the provision of section 213 (A) of Myanmar Merchant Shipping Act, the Department of Marine Administration provided this national requirements for Fishing Vessels of 24 meters in Length and above of Myanmar ships engaged on international voyages.

3. The Department of Marine Administration shall use this prepared safety requirements for fishing vessels of 24 meters in Length and above for national standard of Myanmar fishing vessels engaged on International waters.

Maung Maung Oo
Director General
Department of Marine Administration

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CHAPTER 1

GENERAL PROVISIONS

1 Application

1 The present requirements, hereafter called the Requirements, shall apply to new fishing vessels of 24 metres in length (L) and above. Paragraph 1 of each chapter lists the requirements of the chapter that are also applicable to existing ships of the same length. For existing ships, those requirements shall enter into force two years after the adoption of the Requirements.

2 The Requirements do not apply to fishing vessels for sport or recreation, to processing vessels, to training or research vessels or to vessels only used for carrying fish.

3 The provisions of the present chapter shall also apply to existing ships.

2 Definitions

For the purpose of the requirements, unless expressly provided otherwise, the definitions in Paragraph 2 of the procedural requirements for ship safety certification and safe manning are applicable. Furthermore, the following definitions apply, together with the illustrations of terms contained in annex 1.

Amidships is the mid-length of L.

Approved means approved by the Administration.

Baseline is the horizontal line intersecting at amidships the keel line.

Bow height defined as the vertical distance at the forward perpendicular between the waterline corresponding to the maximum permissible operating draught and the designed trim and the top of the exposed deck at side.

Breadth (B) is the maximum breadth of the vessel, measured amidships to the moulded line of the frame in a vessel with a metal shell and to the outer surface of the hull in a vessel with a shell of any other material.

Collision bulkhead is a watertight bulkhead up to the working deck in the forepart of the vessel.

Crew means the skipper and all persons employed or engaged in any capacity on board a vessel on the business of that vessel.

Deck erection is any decked structure on the working deck.

Deepest operating waterline is the waterline related to the maximum permissible operating draught.

The **depth (D)** is the moulded depth amidships.

Enclosed superstructure is a superstructure with:

.1 enclosing bulkheads of efficient construction;

.2 access openings, if any, in those bulkheads fitted with permanently attached weathertight doors of a strength equivalent to the unpierced structure which can be operated from each side; and

.3 other openings in sides or ends of the superstructure fitted with efficient weathertight means of closing.

A raised quarter-deck is regarded as a superstructure.

A bridge or poop shall not be regarded as enclosed unless access is provided for the crew to reach machinery and other working spaces inside those superstructures by alternative means which are available at all times when bulkhead openings are closed.

Fishing vessel (hereafter called vessel) is a vessel used commercially for catching fish, whales, seals, walrus, or other living resources of the sea.

The forward and after perpendiculars shall be taken at the forward and after ends of the length (L). The forward perpendicular shall be coincident with the foreside of the stem on the waterline on which the length is measured.

Freeboard (fmin) is the actual minimum freeboard and is the distance from the underside of the working deck at the side to a waterline, measured perpendicularly to the waterline, plus the minimum thickness of decking. When the working deck is stepped, the lowest line of the deck and the continuation of that line parallel to the upper part of the deck shall be taken as the working deck.

Height of a superstructure or other erection is the least vertical distance measured at side from the top of the deck beams of a superstructure or an erection to the top of the working deck beams.

Keel line is the line parallel to the slope of keel passing amidships through:

.1 the top of the keel or line of intersection of the inside of shell plating with the keel where a bar keel extends above that line of a vessel with a metal shell;

.2 the rabbet lower line of the keel of a vessel with a shell of wood or a composite material; or

.3 the intersection of a fair extension of the outside of the shell contour at the bottom with the centreline of a vessel with a shell of material other than wood and metal.

Least depth (D) is the depth measured from the keel line to the top of the working deck beam at side at the point where a parallel to the keel line is tangent to the deck line. Where the working deck is stepped and the raised part of the deck extends over the point at which the least depth is to be determined, the least depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

Midship section is that section of the hull defined by the intersection of the moulded surface of the hull with a vertical plane perpendicular to the water and centreline planes passing through amidships.

The **moulded depth** is the vertical distance measured from the keel line to the top of the working deck beam at side. In vessels having rounded gunwales, the moulded depth is measured to the point of intersection of the moulded lines of deck and side shell plating, the lines extending as though the gunwale were of angular design. Where the working deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth is measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

Place of shelter is any naturally or artificially protected area easily accessible to the vessel and which can be used for sheltering the vessel in circumstances which are unfavourable to its safety.

The **Procedural Requirements** are the Procedural requirements for ship safety and safe manning.

Processing vessel is a vessel used exclusively for processing fish and other living resources of the sea.

The **Protocol** means the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as modified by the Torremolinos Protocol of 1993 relating thereto.

Skipper means the person having command of a fishing vessel.

Steel or other equivalent material means steel or any material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable fire exposure to the standard fires test (e.g. aluminium alloy with appropriate insulation).

Superstructure is the decked structure on the working deck extending from side to side of the vessel or with the side plating not being inboard of the shell plating more than 0.04 B.

Superstructure deck is that complete or partial deck or the top of a superstructure, deckhouse or other erections situated at a height of not less than 1.8 m above the working deck. Where this height is less that 1.8 m, the top of such deckhouses or other erections shall be treated in the same way as the working deck.

Watertight means capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed.

Weathertight means that in any sea conditions water will not penetrate into the vessel.

Working deck is generally the lowest complete deck above the deepest operating waterline from which fishing is undertaken. In vessels fitted with two or more complete decks, the Administration may accept a lower deck as a working deck provided that that deck is situated above the deepest operating waterline.

Measurements in the requirements are given in the metric system using the following abbreviations:

m	-	metre
cm	-	centimetre
mm	-	millimetre
t	-	tonne (1,000 kg)
kg	-	kilogram
mt	-	metre - tonne
ºC	-	degree centigrade
s	-	second
N	-	Newton
kW	-	Kilowatt

3 Safety Certificate

1 The hull, machinery, equipment and radio installations as well as crew accommodation of every vessel shall be constructed and installed so as to be capable of being regularly maintained to ensure that they are at all times, in all respects, satisfactory for the vessel's intended service and in conformity with the present requirements.

2 Survey and certification of every vessel shall conform to the provisions of the Procedural requirements.

3 Every vessel shall have on board a valid "Safety Certificate for Fishing Vessel", together with a Record of Equipment, according to the model given in the Appendix. For an existing ship, the "Safety Certificate for Fishing Vessel" means that the vessel comply with the provisions of the requirements which apply to existing ships.

CHAPTER 2

CONSTRUCTION, WATERTIGHT INTEGRITY AND EQUIPMENT

1. Construction

1 The provisions of paragraphs 15 and 16 of the present chapter shall also apply to existing ships.

2 Strength and construction of hull, superstructures, deckhouses, machinery casings, companionways and any other structures and vessel's equipment shall be sufficient to withstand all foreseeable conditions of the intended service and shall be to the satisfaction of the Administration. If necessary, the Administration could refer to the rules of a recognized organization

3 The hull of vessels intended for operation in ice shall be strengthened in accordance with the anticipated conditions of navigation and area of operation.

4 Bulkheads, closing devices and closures of openings in these bulkheads, as well as methods for their testing, shall be in accordance with the present requirements and with the requirements of the Administration. Vessels shall be fitted with a collision bulkhead and at least with watertight bulkheads bounding the main machinery space. Such bulkheads shall be extended up to the working deck. In vessels constructed of wood, such bulkheads which as far as practicable shall be watertight, shall also be fitted.

5 Watertight doors fitted in watertight bulkheads should be capable of being opened and closed locally at the door on either side and preferably also from above the working deck. Means of operating doors should be clearly marked, and should indicate whether doors are open or closed. Pipes piercing the collision bulkhead should be fitted with suitable valves operable from above the working deck and the valve chest should be secured at the collision bulkhead inside the forepeak. No door, manhole, ventilation duct or any other opening should be fitted in the collision bulkhead below the working deck.

6 Where a long forward superstructure is fitted, the collision bulkhead should be extended weathertight to the deck next above the working deck. The extension need not be fitted directly over the bulkhead below provided it is located within the limits given in 1.2.6 and the part of the deck which forms the step is made effectively weathertight.

7 The number of openings in the collision bulkhead above the working deck should be reduced to the minimum compatible with the design and normal operation of the vessel. Such openings should be capable of being closed weathertight.

8 In vessels of 75 m in length and over, a watertight double bottom shall be fitted, as far as practicable, between the collision bulkhead and the afterpeak bulkhead.

2 Watertight doors

1 The number of openings in watertight bulkheads, as required by paragraph 1.4, shall be reduced to the minimum compatible with the general arrangements and operational needs of the vessel; openings shall be fitted with watertight closing appliances. Watertight doors shall be of an equivalent strength to the adjacent unpierced structure.

2 In vessels of less than 45 m in length, such doors may be of the hinged type, which shall be capable of being operated locally from each side of the door and shall normally be kept closed at sea. A notice is attached to the door on each side to state that the door should be kept closed at sea.

3 In vessels of 45 m in length and over, watertight doors shall be of the sliding type in:

.1 spaces where it is intended to open them at sea and if located with their sills below the deepest operating waterline, unless the Administration considers it to be impracticable or unnecessary, taking into account the type and operation of the vessels; and

.2 the lower part of a machinery space where there is access from it to a shaft tunnel.

Otherwise watertight doors may be of the hinged type.

4 Sliding watertight doors shall be capable of being operated when the vessel is listed up to 15% either way.

5 Sliding watertight doors whether manually-operated or otherwise shall be capable of being operated locally from each side of the door; in vessels of 45 m in length and over these doors shall also be capable of being operated by remote control from an accessible position above the working deck except when the doors are fitted in crew accommodation spaces.

6 Means shall be provided at remote operating positions to indicate when a sliding door is open or closed.

3 Hull integrity

1 External openings shall be capable of being closed so as to prevent water from entering the vessel. Deck openings which may be open during fishing operations shall normally be arranged near to the vessel's centreline. However, the Administration may approve different arrangements if satisfied that the safety of the vessel will not be impaired.

2 Fish flaps on stern trawlers shall be power-operated and capable of being controlled from any position which provides an unobstructed view of the operation of the flaps.

4 Weathertight doors

1 An access openings in bulkheads of enclosed superstructures and other outer structures through which water could enter and endanger the vessel, shall be fitted with doors permanently attached to the bulkhead, framed and stiffened so that the whole structure is of equivalent strength to the unpierced structure, and weathertight when closed. The means for securing these doors weathertight shall consist of gaskets and clamping devices or other equivalent means and shall be permanently attached to the bulkhead or to the doors themselves, and shall be so arranged that they can be operated from each side of the bulkhead. The Administration may, without prejudice to the safety of the crew, permit the doors to be opened from one side only for freezer rooms, provided that a suitable alarm device is fitted to prevent persons being trapped in those rooms.

2 The height above deck of sills in those doorways, in companionways, erections and machinery casings which give direct access to parts of the deck exposed to the weather and sea shall be at least 600 mm on the working deck and at least 300 mm on the superstructure deck. Where operating experience has shown justification and on approval of the Administration, these heights, except in the doorways giving direct access to machinery spaces, may be reduced to not less than 380 mm and 150 mm respectively.

5 Hatchways closed by wood covers

Hatchways closed by wood covers shall be prohibited.

6 Hatchways closed by covers other than wood

1 The height above deck of hatchway coamings shall be at least 600 mm on exposed parts of the working deck and at least 300 mm on the superstructure deck. Where operating experience has shown justification, and on the approval by the Administration, the height of these coamings may be reduced, or the coamings omitted entirely, provided that the safety of vessels is not thereby impaired. In this case, the hatchway openings shall be kept as small as practicable and the covers be permanently attached by hinges or equivalent means and be capable of being rapidly closed and battened down.

2 For the purpose of strength calculations, it is assumed that hatchway covers are subjected to the weight of cargo intended to be carried on them or to the following static loads, whichever is the greater:

.1 10 kN/m^2 for vessels of 24 m in length;

.2 17 kN/m^2 for vessels of 100 m in length and over.

For intermediate lengths the load values should be determined by linear interpolation. The Administration may reduce the loads to not less than 75% of the above values for covers to hatchways situated on the superstructure deck in a position abaft a point located 0.25 L of the length of the vessel measured from the forward perpendicular.

3 Where covers are made of mild steel, the maximum stress calculated according to paragraph 2 and multiplied by 4.25 shall not exceed the minimum ultimate strength of the material. Under these loads the deflections shall not be more than 0.0028 times the span.

4 Covers made of materials other than mild steel shall be at least of equivalent strength to those made of mild steel and their construction shall be of sufficient stiffness to ensure weathertightness under the loads specified in paragraph 2.

5 Covers shall be fitted with clamping devices and gaskets or other equivalent arrangements sufficient to ensure weathertightness.

7 Machinery space openings

1 Machinery space openings shall be framed and enclosed by casings of a strength equivalent to the adjacent superstructure. External access openings therein shall be fitted with doors complying with paragraph 4.

2 Openings other than access openings shall be fitted with covers of equivalent strength to the unpierced structure, permanently attached thereto and capable of being closed weathertight.

8 Other deck openings

1 Where it is essential for fishing operations, flush deck scuttles of the screw, bayonet or equivalent type and manholes may be fitted provided these are capable of being closed watertight and such devices shall be permanently attached to the adjacent structure. Having regard to the size and disposition of the openings and the design of the closing devices, metal-

to-metal closures may be fitted if the Administration is satisfied that they are effectively watertight.

2 Openings other than hatchways machinery space openings, manholes and flush scuttles in the working or superstructure deck, shall be protected by enclosed structures fitted with weathertight doors or their equivalent. Companionways shall be situated as close as practicable to the centreline of the vessel.

9 Ventilators

1 In vessels of 45 m in length and over, the height above deck of ventilator coamings, other than machinery space ventilator coamings, shall be at least 900 mm on the working deck and at least 760 mm on the superstructure deck. In vessels of less than 45 m in length, the height of these coamings shall be 760 mm and 450 mm respectively. The height above deck of machinery space ventilator openings shall be to the satisfaction of the Administration.

2.9.2 Coamings of ventilators shall be of equivalent strength to the adjacent structure and capable of being closed weathertight by closing appliances permanently attached to the ventilator or adjacent structure. Where the coaming of any ventilator exceeds 900 mm in height it shall be specially supported.

2.9.3 Closing appliances in vessels of 45 m in length and over need not be fitted to ventilators the coamings of which extend to more than 4.5 m above the working deck or more than 2.3 m above the superstructure deck unless specifically required by the Administration. In vessels of less than 45 m in length, closing appliances need not be fitted to ventilators the coamings of which extend to more than 3.4 m above the working deck or more than 1.7 m above the superstructure deck. If the Administration is satisfied that it is unlikely that water will enter the vessel through machinery space ventilators, closing appliances to such ventilators may be omitted.

10 Air pipes

1 Where air pipes to tanks and void spaces below deck extend above the working or the superstructure decks, the exposed parts of the pipes shall be of strength equivalent to the adjacent structures and fitted with appropriate protection. Openings of air pipes shall be provided with means of closing, permanently attached to the pipe or adjacent structure.

2 The height of air pipes above deck to the point where water may have access below shall be at least 760 mm on the working deck and at least 450 mm on the superstructure deck. The Administration may accept reduction of the height of an air pipe to avoid interference with the fishing operations.

11 Sounding devices

1 Sounding devices shall be fitted:

.1 to the bilges of those compartments which are not readily accessible at all times during the voyage; and

.2 to all tanks and cofferdams.

2 Where sounding pipes are fitted, their upper ends shall be extended to a readily accessible position and, where practicable, above the working deck. Their openings shall be provided with permanently attached means of closing. Sounding pipes which are not extended above the working deck shall be fitted with automatic self-closing devices.

3 Sounding arrangements on fuel service tanks shall be such that in the event of the tanks being overfilled, spillage through the means of sounding cannot occur.

4 Fuel oil tank sounding pipe openings shall not be located in crew accommodation, but may exceptionally be installed in passageways, in which case flush deck screwed caps shall be fitted.

12 Sidescuttles and windows

1 Sidescuttles to spaces below the working deck and to spaces within the enclosed structures on that deck shall be fitted with hinged deadlights capable of being closed watertight.

2 No sidescuttle shall be fitted in such a position that its sill is less than 500 mm above the deepest operating waterline.

3 Sidescuttles fitted less than 1,000 mm above the deepest operating waterline shall be of the fixed type.

4 Sidescuttles, together with their glasses and deadlights shall be of an approved construction. Those prone to be damaged by fishing gear shall be suitably protected.

5 Toughened safety glass or its equivalent shall be used for the wheelhouse windows.

6 The Administration may accept sidescuttles and windows without deadlights in side or aft bulkheads of deck erections located on or above the working deck if satisfied that the safety of the vessel will not be impaired.

13 Inlets and discharges

1 Discharges led through the shell either from spaces below the working deck or from within enclosed superstructures or deckhouses on the working deck fitted with doors complying with the requirements of paragraph 4 shall be fitted with means for preventing water from passing inboard. Normally each separate discharge shall have an automatic non-return valve with a positive means of closing it from a readily accessible position. Such a valve is not required if the Administration considers that the entry of water into the vessel through the opening is not likely to lead to dangerous flooding and that the thickness of the pipe is sufficient. The means for operating the valve with a positive means of closing shall be provided with an indicator, showing whether the valve is open or closed.

2 In manned machinery spaces main and auxiliary sea inlets and discharges essential for the operation of machinery shall be controlled locally. Controls shall be readily accessible and shall be provided with indicators showing whether the valves are open or closed.

3 Fittings attached to the shell and all valves referred to the present requirements shall be of steel, bronze or other ductile material. All pipes between the shell and the valves shall be of

steel, except that in spaces other than machinery spaces of vessels constructed of material other than steel the Administration may approve the use of other materials.

14 Freeing ports

1 Where bulwarks on weather parts of the working deck form wells, the minimum freeing port area (A) in square metres on each side of the vessel for each well on the working deck shall be determined in relation to the length (I) and height of bulwark in the well as follows:

.1 $A = 0.07 \bullet l$

(l need not be taken as greater than 70% of the length L of the vessel).

.2 Where the bulwark is more than 1.2 m in average height, the required area in .1 shall be increased by 0.004 m2 per metre of length of well for each 100 mm difference in height.

.3 Where the bulwark is less than 900 mm in average height, the required area may be decreased by 0.004 m2 per metre of length of well for each 100 mm difference in height.

2 The freeing port area calculated according to paragraph 1 shall be increased where the Administration considers that the vessel's sheer is not sufficient to ensure that the deck is rapidly and effectively freed of water.

3 The minimum freeing port area for each well on the superstructure deck shall be not less than one half the area (A) given in paragraph 1.

4 Freeing ports shall be so arranged along the length of bulwarks as to ensure that the deck is freed of water most rapidly and effectively. Lower edges of freeing ports shall be as near the deck as practicable.

5 Poundboards and means for stowage of the fishing gear shall be arranged so that the effectiveness of freeing ports will not be impaired or water trapped on deck and prevented from easily reaching the freeing ports. Poundboards shall be so constructed that they can be locked in position when in use and shall not hamper the discharge of shipped water.

6 Freeing ports over 300 mm in depth shall be fitted with bars spaced not more than 230 mm nor less than 150 mm apart or provided with other suitable protective arrangements. Freeing port covers, if fitted, shall be of approved construction. If devices are considered necessary for locking freeing port covers during fishing operations, they shall be to the satisfaction of the Administration and easily operable from a readily accessible position.

7 In vessels intended to operate in areas subject to icing, covers and protective arrangements for freeing ports shall be capable of being easily removed to restrict ice accretion. The size of openings and means provided for removal of these protective arrangements shall be to the satisfaction of the Administration.

15 Anchor and mooring equipment

Anchor equipment designed for quick and safe operation shall be provided which shall consist of anchoring equipment, anchor chains or wire ropes, stoppers and a windlass or other arrangements for dropping and hoisting the anchor and for holding the vessel at anchor in all foreseeable service conditions. Vessels shall also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchor and mooring equipment shall at least be in conformity with the recommended practice provided in annex 2.

16 Working deck within an enclosed superstructure

1 Such decks shall be fitted with an efficient drainage system having an appropriate drainage capacity to dispose of water or fish waste which may occur from deck washing, fish processing or from the sea through openings that may be open during fishing operations, to the satisfaction of the Administration.

2 All openings necessary for fishing operations shall be provided with means for quick and efficient closure by one person.

3 Where the catch is brought on to such decks for handling or processing, the catch shall be placed in a pound. Such pounds shall comply with paragraph 11 of chapter 3. An efficient drainage system shall be fitted. Adequate protection against inadvertent influx of water to the working deck shall be provided.

4 At least two exits from such decks shall be provided.

5 The clear headroom in the working space shall, at all points, be to the satisfaction of the Administration.

6 A fixed ventilation system providing at least 6 renewal of air per hour shall be provided.

17 Tanks for fish in refrigerated (RSW) or chilled (CSW) seawater

1 If RSW or CSW-tanks or similar tank systems are used, such tanks shall be provided with a separate, permanently fitted arrangement for the filling and emptying of seawater.

2 If such tanks are to be used also for carrying dry cargo, the tanks shall be arranged with a bilge system and provided with adequate means to avoid ingress of water from the bilge system into the tanks.

CHAPTER 3

STABILITY AND ASSOCIATED SEAWORTHINESS

1 General

1 Vessels shall be so designed and constructed that the requirements of this chapter will be satisfied in the operating conditions referred to in paragraph 7. Calculations of the righting lever curves shall be carried out to the satisfaction of the Administration1.

2 On existing ships, wherever practicable, it shall be proceeded to an approximate determination of the vessel's stability by means of the rolling period test including values of rolling coefficients particular to the vessel.

2 Stability criteria

1 The following minimum stability criteria shall be met :

.1 the area under the righting level curve (GZ curve) shall not be less than 0.055 m-rad up to 30° angle of heel and not less than 0.090 m–rad up to 40° or the angle of flooding θf if this angle is less than 40°. Additionally, the area under the righting level curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θf, if this angle is less than 40° shall not be less than 0.030 m-rad. θf is the angle of heel at which openings in the hull, superstructure or deckhouses which cannot rapidly be closed watertight commence to immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;

.2 the righting level GZ shall be at least 200 mm at an angle of heel equal to or greater than 30°;

.3 the maximum righting level GZmax shall occur at an angle of heel preferably exceeding 30° but not less than 25°;

.4 the initial metacentric height GM0 shall not be less than 350 mm for single deck vessels. In vessels with complete superstructure the metacentric height

2 Where arrangements other than bilge keels are provided to limit the angles of roll, the Administration shall be satisfied that the stability criteria given in paragraph 1 are maintained in all operating conditions.

3 Where ballast is provided to ensure compliance with paragraph 1, its nature and arrangements shall be to the satisfaction of the Administration.

4 It shall be ensured that stability characteristics of the vessel will not produce acceleration forces which can be prejudicial to the safety of the vessel and crew.

5 For vessels for which, by reason of insufficient stability data, paragraph 1 cannot be applied, the following approximate formula for the minimum metacentric height GMmin, in metres, for all operating conditions shall be used as the criterion:

$$GM\min = 0.53 + 2B\left[0.075 - 0.37\left(\frac{f}{B}\right) + 0.82\left(\frac{f}{B}\right)^2 - 0.014\left(\frac{B}{D}\right) - 0.032\left(\frac{l_s}{L}\right)\right]$$

where:

L, B, D and f, in metres, are as defined in paragraph 2 of chapter 1; and

ls is the actual length of enclosed superstructure extending from side to side of the vessel, in metres, as defined in paragraph 2 of chapter 1.

The formula is applicable for vessels having:

.1 $\frac{f}{B}$ between 0.02 and 0.20;

.2 $\frac{l_s}{L}$ smaller than 0.60;

.3 $\frac{B}{D}$ between 1.75 and 2.15;

.4 sheer fore and aft at least equal to or exceeding the standard sheer prescribed in paragraph 38(8) of the International Convention on Load Lines, 1966; and

.5 height of superstructure included in the calculation not less than 1.8 m.

For vessels with parameters outside of the above limits the formula shall be applied with special care.

6 The above formula is not intended as a replacement for the basic criteria given in paragraph .1 and in paragraph 5, but shall be used only if circumstances are such that cross-curves of stability, KM curve and subsequent GZ curves are not and cannot be made available for judging a particular vessel's stability.

7 The calculated value of GM_{min} shall be compared with actual GM values of the vessel in all loading conditions. If a rolling test, as indicated in paragraph 2.1, an inclining experiment based on estimated displacement, or another approximate method of determining the actual GM is used, a safety margin shall be added to the calculated GMmin.

3 Flooding of fish-holds

The angle of heel at which progressive flooding of fish-holds could occur through hatches which remain open during fishing operations and which cannot rapidly be closed shall be at least 20° unless the stability criteria of paragraph 2.1 can be satisfied with the respective fish-holds partially or completely flooded.

4 Particular fishing methods

Vessels engaged in particular fishing methods where additional external forces are imposed on the vessel during fishing operations, shall meet the stability criteria of paragraph 2.1 increased, if necessary, to the satisfaction of the Administration.

5 Severe wind and rolling

For vessels intended for operation in areas where exceptionally adverse weather condition may be experienced, special attention shall be given to the capability to withstand the capsizing effects of breaking waves. In order to demonstrate ability to withstand such effects, the Administration shall give consideration to the benefits of enclosed deck erections which may provide an improved range of positive stability to larger angels of heel with openings assumed closed weathertight. A positive range of stability up to an angle of 80° may be used as a

criterion. Alternatively, the “severe wind and rolling criterion (weather criterion)” for fishing vessels may be used.

6 Water on deck

Vessels shall be able to withstand, to the satisfaction of the Administration, the effect of water on deck, taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation.

7 Operating conditions

1 The number and type of operating conditions to be considered shall include the following, as appropriate:

.1 departure for the fishing grounds with full fuel, stores, ice, fishing gear, etc.;

.2 departure from the fishing grounds with full catch;

.3 arrival at home port with full catch and 10% stores, fuel, etc.; and

.4 arrival at home port with 10% stores, fuel, etc. and a minimum catch, which shall normally be 20% of full catch but may be up to 40% provided the Administration is satisfied that operating patterns justify such a value.

2 In addition to the specific operating conditions given in paragraph 1 the minimum stability criteria given in paragraph 2 shall be met under all other actual operating conditions including those which produce the lowest values of the stability parameters contained in these criteria. The Administration shall also be satisfied that those special conditions associated with a change in the vessel's mode or areas of operation which affect the stability considerations of this chapter are taken into account.

3 Concerning the conditions referred to in paragraph 1, the calculations shall include the following:

.1 allowance for the weight of the wet fishing nets and tackle, etc. on deck;

.2 allowance for ice accretion, if anticipated, in accordance with paragraph 8;

.3 homogeneous distribution of the catch, unless this is inconsistent with practice;

.4 catch on deck, if anticipated, in operating conditions referred to in paragraphs 1.2, 1.3 and 2;

.5 water ballast if carried either in tanks which are especially provided for this purpose or in other tanks also equipped for carrying water ballast; and

.6 allowance for the free surface effect of liquids and, if applicable, catch carried.

8 Ice accretion

1 For vessels operating in areas where ice accretion is likely to occur the following icing allowance shall be made in the stability calculations:

.1 30 kg/m^2 on exposed weather decks and gangways;

.2 7.5 kg/m^2 for the projected lateral area of each side of the vessel above the water-plane; and

.3 the projected lateral area of discontinuous surfaces of rail, spars (except masts) and rigging of vessels having no sails and the projected lateral area of other small objects shall be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%.

2 The height of the centre of gravity of ice accretion shall be calculated according to the position of corresponding parts of the decks and gangways and other continuous surfaces on which ice can accumulate.

3 Vessels intended for operation in areas where ice accretion is known to occur shall be:

.1 designed to minimize the accretion of ice; and

.2 equipped with such means for removing ice as the Administration may require.

9 Inclining test

1 Every vessel shall undergo an inclining test upon its completion and the actual displacement and position of the centre of gravity shall be determined for the lightship condition.

2 Where alterations are made to a vessel affecting its light ship condition and the position of the centre of gravity, the vessel shall be re-inclined and the stability information revised, unless the Administration considers this unnecessary.

3 The inclining test of an individual vessel may be omitted provided basic stability data are available from the inclining test of a sister ship, and it is demonstrated that reliable stability information for the vessel can be obtained from such basic data.

10 Stability information

1 Suitable stability information shall be supplied to enable the skipper to assess with ease and certainty the stability of the vessel under various operating conditions.8 Such information shall include specific instructions to the skipper warning him of those operating conditions which can adversely affect either the stability or the trim of the vessel. A copy of the stability information shall be submitted to the Administration for approval.

2 The stability information, referred to in paragraph 1, shall be kept on board, readily accessible at all times and inspected at the periodical surveys of the vessel to ensure that it has been approved for the actual operating conditions.

3 Where alterations are made to a vessel affecting its stability, revised stability calculations shall be undertaken. The new information shall be supplied to the skipper and the superseded information removed.

4 Scales indicating the vessel's draught shall be permanently marked on both sides of the stem and stern. These scales shall be measured perpendicularly from a datum line which will lie along, or be a projection of, the lower extremity of the keel or other appendage. Numbers 0.1 m in the vertical plane shall be marked on the scale, the lower edge of each number indicating the draught in metres. Between the numbers lines shall be marked, parallel to the datum, at intervals of 0.1 m. The skipper shall be provided with information defining the position of the datum line and instructions regarding the use of observed draughts.

11 Portable fish-hold divisions

The catch shall be properly secured against shifting which can cause dangerous trim or heel of the vessel. The scantlings of portable fish-hold divisions, if fitted, shall be to the satisfaction of the Administration10.

12 Bow height

The bow height shall be sufficient, to the satisfaction of the Administration, to prevent the excessive shipping of water and is determined taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation.

13 Maximum permissible operating draught

1 A maximum permissible operating draught shall be fixed and shall be such that, in the associated operating condition, the stability criteria of this chapter and the provisions of chapters 2 and 6, as appropriate, are satisfied.

2 The maximum permissible operating draught shall be marked on each side of the vessel. The location of the maximum permissible operating draught shall be indicated on the safety certificate of the vessel.

14 Subdivision and damage stability

Vessels of 100 m in length and over, where the total number of persons carried is 100 or more, shall be capable, to the satisfaction of the A2dministration, of remaining afloat with positive stability, after the flooding of any one compartment assumed damaged, having regard to the type of vessel, the intended service and area of operation.

CHAPTER 4
MACHINERY AND ELECTRICAL INSTALLATIONS PART A - GENERAL

1 Definitions

1 Main steering gear is the machinery, the steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the vessel under normal service conditions.

2 Auxiliary means of activating the rudder is the equipment which is provided for effecting movement of the rudder for the purpose of steering the vessel in the event of failure of the main steering gear.

3 Steering gear power unit means, in the case of:

.1 electric steering gear, an electric motor and its associated electrical equipment;

.2 electro-hydraulic steering gear, an electric motor and its associated electrical equipment and connected pump; and

.3 other hydraulic steering gear, a driving engine and connected pump.

4 Maximum ahead service speed is the greatest speed which the vessel is designed to maintain in service at sea at its maximum permissible operating draught.

5 Maximum astern speed is the speed which it is estimated the vessel can attain at the designed maximum astern power at its maximum permissible operating draught.

6 Fuel oil unit is the equipment used for the preparation of fuel oil for delivery to an oil-fired boiler, or equipment used for the preparation of oil for delivery to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure greater than 0.18 N/mm^2.

7 Normal operational and habitable conditions means conditions under which the vessel as a whole, its machinery services, means of main and auxiliary propulsion, steering gear and associated equipment, aids to safe navigation and to limit the risks of fire and flooding, internal and external means of communicating and signalling, means of escape and winches for rescue boats, are in proper working order and the minimum comfortable conditions of habitability are satisfactory.

8 Dead ship condition is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

9 Main switchboard is a switchboard directly supplied by the main source of electrical power and intended to distribute electrical energy.

10 Periodically unattended machinery spaces means those spaces containing main propulsion and associated machinery and all sources of main electrical supply which are not at all times manned under all operating conditions including manoeuvring.

2 General
Machinery installations

1 Main propulsion, control, steam pipe, fuel oil, compressed air, electrical and refrigeration systems; auxiliary machinery; boilers and other pressure vessels; piping and pumping arrangements; steering equipment and gears, shafts and couplings for power transmission shall be designed, constructed, tested, installed and serviced in accordance with the rules of a recognized organization. This machinery and equipment, as well as lifting gear, winches, fish handling and fish processing equipment shall be protected so as to reduce to a minimum any danger to persons on board. Special attention shall be paid to moving parts, hot surfaces and other dangers.

2 Machinery spaces shall be so designed as to provide safe and free access to all machinery and its controls as well as to any other parts which may required servicing. Such spaces shall be adequately ventilated.

3 Passages of sufficient width but not less than 600 mm shall be provided between main engine and auxiliary machinery or main switchboard.

4 Means shall be provided whereby the operational capability of the propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the functioning of:

.1 the arrangements which supply fuel oil pressure for main propulsion machinery;

.2 the normal sources of lubricating oil pressure;

.3 the hydraulic, pneumatic and electrical means for the control of main propulsion machinery including controllable pitch propellers;

.4 the sources of water pressure for main propulsion cooling systems; and

.5 an air compressor and an air receiver for starting or control purposes, provided that the Administration may, having regard to overall safety considerations, accept a partial reduction in capability in lieu of full normal operation.

5 Means shall be provided whereby the machinery can be bought into operation from the dead ship condition without external aid.

6 Main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel shall, as fitted, be capable of operating whether the vessel is upright or listed up to 15° either way under static conditions and up to 22.5° either way under dynamic conditions, i.e. when rolling either way and simultaneously pitching (inclined dynamically) up to 7.5° by bow or stern. The Administration may permit deviation from these angles, taking into consideration the type, size and service conditions of the vessel.

7 Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of their vibrations shall not cause undue stresses in such machinery systems in the normal operating ranges.

8 All controls for operating the machinery and equipment, measuring devices, pumping systems and arrangements, valves, cocks, air pipes, inlets, sounders, switches, etc. shall be permanently marked with appropriate inscriptions clearly showing their purpose. Pipes shall preferably be marked by appropriate colours to indicate their purpose. All handwheels shall be marked with pointers showing the direction of turning, which generally shall be clockwise for closure.

9 Steam fittings, steam pipes and exhaust pipes and other hot surfaces within reach of personnel shall be properly insulated or otherwise protected to prevent accidents or burns. Hot surfaces which could cause ignition shall be protected from all possible contacts with combustible liquid.

10 Plastic piping shall not be used for any purpose in the machinery spaces where its destruction by fire would present a safety hazard.

11 Railings on gratings in the machinery spaces shall consist of a handrail and guard rail where practicable, toe boards approximately 60 mm high shall be affixed to the edge of all gratings where appropriate.

12 Openings to machinery space bilges shall be properly guarded with handrails and toe boards or gratings.

13 Floor plates shall be properly fitted and secured in place and shall have a non-slip surface where practicable.

14 Machinery space ladders shall be fitted with non-slip treads and well maintained. Adequate handrails shall be provided.

15 Spare parts and stores shall be provided to the satisfaction of the Administration. Adequate facilities shall be provided for the safe stowage of spare parts and stores.

16 Information on operation and maintenance of machinery and boilers, usage of fuels and lubricating oils shall be provided.

17 Water-level indicators, pressure gauges and other measuring devices shall be so installed and illuminated as to be readily visible.

Electrical installations

18 The design and construction of electrical installations shall be such as to provide:

.1 the services necessary to maintain the vessel in normal operational and habitable conditions without having recourse to an emergency source of power;

.2 the services essential to safety when failure of the main source of electrical power occurs; and

.3 protection of the crew and vessel from electrical hazards.

19 The Administration shall be satisfied that the provisions of paragraphs 15 to 17 are uniformly implemented and applied.

Periodically unattended machinery spaces

20 In addition to paragraphs 2 to 17 and chapter 5, the provisions of paragraphs 18 to 23 shall apply to vessels with periodically unattended machinery spaces.

21 Measures shall be taken to the satisfaction of the Administration to ensure that all equipment is functioning in a reliable manner in all operating conditions, including manoeuvring, and that arrangements are made for regular inspections and routine tests to ensure continuous reliable operation.

22 Vessels shall be provided with documentary evidence to the satisfaction of the Administration of their fitness to operate with periodically unattended machinery spaces.

PART B – MACHINERY INSTALLATIONS
(see also paragraph 2)

3 Machinery

1 Main and auxiliary machinery essential for the propulsion and safety of the vessel shall be provided with effective means of control.

2 Internal combustion engines of a cylinder diameter greater than 200 mm or a crankcase volume greater than 0.6 m3 shall be provided with crankcase explosion relief valves of an approved type with sufficient relief area.

3 Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure, means shall be provided, where applicable, which will protect against such excessive pressure.

4 All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the vessel or the safety of persons on board shall be so designed and constructed that it will withstand the maximum working stresses to which it may be subjected in all service conditions. Due consideration shall be given to the type of engines by which it is driven or of which it forms part.

5 Main propulsion machinery and, where applicable, auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures, such as lubricating oil supply failure, which could lead rapidly to damage, complete breakdown or explosion. An advance alarm shall also be provided so that warning is given before automatic shut-off but the Administration may permit provisions for overriding automatic shut-off devices. The Administration may also exempt vessels from the provisions of this paragraph, giving consideration to the type of vessel or its specific service.

4 Means of going astern

1 Vessels shall have sufficient power for going astern to secure proper control of the vessel in all normal circumstances.

2 The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time and so to bring the vessel to rest within a reasonable distance from maximum ahead service speed shall be demonstrated at sea.

5 Steam boilers, feed systems and steam piping arrangements

1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, the Administration may, having regard to the output or any other features of any steam boiler or unfired steam generator, permit only one safety valve to be fitted if satisfied that adequate protection against overpressure is thereby provided in accordance with the rules of a recognized organization.

2 Every oil-fire steam boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

3 The Administration shall give special consideration to steam boiler installations to ensure that feed systems, monitoring devices, and safety provisions are adequate in all respects to ensure the safety of boilers, steam pressure vessels and steam piping arrangements.

6 Communication between the wheelhouse and machinery space

Two separate means of communication between the wheelhouse and the machinery space control platform shall be provided, one of which shall be an engine-room telegraph. However, in vessels of less than 45 m in length, where the propulsion machinery is directly controlled from the wheelhouse, the Administration may accept only one means of communication other than an engine-room telegraph. Due account shall be taken of the noise level in the engine-room when selecting and locating these means of communication.

7 Wheelhouse control of propulsion machinery

1 Where remote control of propulsion machinery is provided from the wheelhouse, the following shall apply:

.1 Under all operating conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the wheelhouse;

.2 Where remote control of propulsion machinery is provided from the wheelhouse, the following shall apply: the remote control referred to in subparagraph .1 shall be performed by means of a control device complying with the rules of a recognized organization with, where necessary, means of preventing overload of the propulsion machinery.

.3 The main propulsion machinery shall be provided with an emergency stopping device in the wheelhouse and independent from the wheelhouse control system referred to in subparagraph .1;

.4 Remote control of the propulsion machinery shall be possible only from one station at a time: at any control station interlocked control units may be permitted. There shall be at each station an indicator showing which station is in control of the propulsion machinery. The transfer of control between the wheelhouse and machinery spaces shall be possible only in the machinery space or control room. In vessels of less than 45 m in length, the Administration may accept that the control in the machinery space be a emergency control, if the surveillance and the control from the wheelhouse be satisfactory.

.5 Indicators shall be fitted in the wheelhouse for:

a) propeller speed and direction in the case of fixed propellers;

b) propeller speed and pitch position in the case of controllable pitch propellers; and

c) advance alarm as required in paragraph 3.5;

.6 It shall be possible to control the propulsion machinery locally even in the case of failure in any part of the remote control system;

.7 Unless the Administration considers it impracticable the design of the remote control system shall be such that if it fails an alarm will be given and the pre-set speed and direction of thrust will be maintained until local control is in operation;

.8 Special arrangements shall be provided to ensure that automatic starting shall not exhaust the starting possibilities. An alarm shall be provided to indicate low starting air pressure and shall be set at a level which will still permit main engine starting operations.

2 Where the main propulsion and associated machinery including sources of main electrical supply are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room, the control room shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision.

3 In general, automatic starting, operational and control systems shall include means for manually overriding the automatic means, even in the case of failure of any part of the automatic and remote control system.

8 Air pressure systems

1 Means shall be provided to prevent excess pressure in any part of compressed air systems and wherever water-jackets or casings of air compressors and coolers might be subjected to dangerous excess pressure due to leakage into them from air pressure parts. Suitable pressure-relief arrangements shall be provided.

2 The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes.

3 Any discharge pipes from starting air compressors shall lead directly to the starting air receivers and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

4 Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

9 Arrangements for fuel oil, lubricating oil and other flammable oils

1 Fuel oil which has a flashpoint of less than 60°C (closed cup test) as determined by an approved flashpoint apparatus shall not be used as fuel, except in emergency generators, in which case the flashpoint shall be not less than 43°C. Provided that the Administration may permit the general use of fuel oil having a flashpoint of not less than 43°C subject to such additional precautions as it may consider necessary and on condition that the temperature of the space in which such fuel is stored or used shall not rise to within 10°C below the flashpoint of the fuel.

2 Safe and efficient means of ascertaining the amount of fuel oil contained in any oil tank shall be provided. If sounding pipes are installed, their upper ends shall terminate in safe positions and shall be fitted with suitable means of closure. Gauges made of glass of substantial thickness and protected with a metal case may be used, provided that automatic closing valves are fitted. Other means of ascertaining the amount of fuel oil contained in any fuel tank may be permitted providing their failure or overfilling of the tanks will not permit release of fuel.

3 Provision shall be made to prevent overpressure in any oil tank or in any part of the fuel oil system including the filling pipes. Relief valves and air or overflow pipes shall discharge to a position and in a manner which is safe.

4 Fuel oil pipes which, if damaged, would allow oil escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve on the tank capable of being closed from a safe position outside the space concerned in the event of a fire arising in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space, it shall be capable of being operated outside this space.

5 Pumps forming part of the fuel oil system shall be separate from any other system and the connections of any such pumps shall be provided with an efficient relief valve which shall be in closed circuit. Where fuel oil tanks are alternatively used as liquid ballast tanks, proper means shall be provided to isolate the fuel oil and ballast systems.

6 No oil tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.

7.1 Fuel oil pipes and their valves and fittings shall be steel or other equivalent material, provided that a minimum of flexible pipes may be used. Such flexible pipes and end attachments shall be of adequate strength and shall be constructed of approved fire resistant material or have fire-resistant coatings in accordance with the rules of a recognized organization. Fitting of those flexible pipes shall be in accordance with the IMO guidelines11.

.2 Where necessary, fuel oil and lubricating oil pipelines shall be screened or otherwise suitably protected to avoid, as far as practicable, oil spray or oil leakage on heated surfaces or into machinery air intakes. The number of joints in piping systems shall be kept to a minimum.

8 Fuel pipes of internal combustion engines shall be of steel of other equivalent material and preferably of a jacketed design. All fuel pipes shall be adequately secured and protected.

9 As far as practicable, fuel oil tanks shall be part of the vessel's structure and shall be located outside machinery spaces of category A. Where fuel oil tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks where fitted and the area of the tank boundary common with the machinery space shall be kept to a minimum. When such tanks are sited within the boundaries of machinery spaces of category A they shall not contain fuel oil having a flashpoint of less than 60°C (closed cup test). In general, the use of freestanding fuel oil tanks shall be avoided in fire hazard areas, and particularly in machinery spaces of category A. When free-standing fuel oil tanks are permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.

10 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

11 The arrangements for the storage, distribution and use of oil employed in pressure lubrication systems shall be in accordance with the rules of a recognized organization. Such arrangements in machinery spaces of category A and, wherever practicable, in other machinery spaces shall at least comply with the provisions of paragraphs 1, 3, 6 and 7, and in so far as necessary, in accordance with the rules of a recognized organization, with paragraphs 2 and 4. This does not preclude the use of sight flow glasses in lubrication systems provided they are shown by test to have a suitable degree of fire resistance.

12 The arrangements for the storage, distribution and use of flammable oils employed under pressure in power transmission systems other than oil referred to in paragraph 10 in control and activating systems and heating systems shall be in accordance with the rules of a recognized organization. In locations where means of ignition are present such arrangements shall at least comply with the provisions of paragraphs 2 and 6 and with the provisions of paragraphs 3 and 7 in respect of strength and construction.

13 Fuel oil, lubricating oil and other flammable oils shall not be carried in forepeak tanks.

14 Oil storage tanks shall not be situated above stairways and ladders, boilers, hot surfaces and electrical equipment. Oil storage tanks and piping shall be arranged to minimize the possibility, in the event of overflow, leakage or rupture, that fuel will come into contact with hot surfaces or electrical components which may cause ignition of the fuel.

15 Vent pipes from fuel oil tanks shall have a net cross section not less than 1.25 times that of the filing pipes, and shall be led from the top of the tank to the open air in a space where no danger will result from overflow or the discharge of oil vapours. The vent pipe outlets shall be fitted with U bends (or other protective arrangements) and metal flame screens easily removable for cleaning. The open area of the screens shall be not less than the cross-section area of the vent pipe.

16 Fuel oil tank sounding pipe openings shall not be located in crew accommodation, but may exceptionally be installed in passageways, in which case flush deck screwed caps shall be fitted.

17 Fuel oil filling stations shall be outside the machinery spaces and so arranged that any overflow cannot come into contact with any hot surface where it might be ignited.

18 Removable oil burners of boilers shall be so constructed as to be removable only after the burner's fuel oil valve has been closed. To ensure the correct sequence for turning on and off fuel oil burners of boilers, fuel oil valves and air dampers shall be so arranged that fuel oil inlet valves can be opened only after air inlet dampers have been opened, and that in turning off oil burners, air inlet dampers can be closed only after fuel oil inlet valves have been secured. Fuel oil filters shall be so placed as to minimize the danger of spraying oil on to hot surfaces and it shall not be possible to remove the covers of any such filter until that filter has been properly isolated from the supply.

19 Overflow pipes from daily service tanks/settling tanks to double bottom and/or bunker tanks shall be fitted with a sight glass and an audible alarm.

10 Bilge pumping arrangements

1 An efficient bilge pumping plant shall be provided which under all practical conditions shall be capable of pumping from and draining any watertight compartment which is neither a permanent oil tank nor a permanent water tank whether the vessel is upright or listed. Wing suctions shall be provided if necessary for that purpose. Arrangements shall be provided for easy flow of water to the suction pipes. Provided the Administration is satisfied that the safety of the vessel is not impaired the bilge pumping arrangements may be dispensed with in particular compartments.

2 At least two independently driven power bilge pumps shall be provided, one of which may be driven by the main engine. A ballast pump or other general service pump of sufficient capacity may be used as a power driven bilge pump.

Power bilge pumps shall be capable of giving a speed of water of at least 2 m/s through the main bilge pipe which shall have an internal diameter of at least:

$$d = 25 + 1.68\sqrt{L(B+D)}$$

where: d is the internal diameter in millimetres, and L, B and D are in metres.

However, the actual internal diameter of the bilge main may be rounded off to the nearest standard size acceptable to the Administration.

3 No bilge suction shall have an inside diameter of less than 50 mm. The arrangement and sizing of the bilge system shall be such that the full rated capacity of the pump specified above can be applied to each of the watertight compartments located between the collision and afterpeak bulkheads.

4 A bilge ejector in combination with an independently driven high pressure seawater pump may be installed as a substitute for one independently driven bilge pump required by paragraph 2, provided this arrangement is to the satisfaction of the Administration.

5 In vessels where fish handling or processing may cause quantities of water to accumulate in enclosed spaces, adequate drainage shall be provided.

6 Bilge pipes shall not be led through fuel oil, ballast or double bottom tanks, unless these pipes are of heavy gauge steel construction.

7 Bilge and ballast pumping systems shall be arranged so as to prevent water passing from the sea or from water ballast spaces into holds or into machinery spaces or from one watertight compartment to another. The bilge connection to any pump which draws from the sea or from water ballast spaces shall be fitted with either a non-return valve or a cock which cannot be opened simultaneously either to the bilges and to the sea or to the bilges and water ballast spaces. Valves in bilge distribution boxes shall be of a non-return type.

8 Any bilge pipe piercing a collision bulkhead shall be fitted with a positive means of closing at the bulkhead with remote control from the working deck with an indicator showing the position of the valve provided that, if the valve is fitted on the after side of the bulkhead and is readily accessible under all service conditions, the remote control may be dispensed with.

9 Valves and cocks not forming part of a piping system shall not be permitted in watertight bulkheads.

10 Bilge suctions shall be fitted with suitable strainers having an open area not less than three times the area of the bilge pipe.

11 One of the bilge pumps shall have direct bilge suction from the compartment where the pump is situated.

12 In vessels of 45 m in length and over, the largest available power water pump in the engine-room suitable for use as a bilge pump shall be fitted with an emergency bilge suction.

13 If fuel tanks are used to carry water ballast for ensuring stability or trim of the vessel, reliable devices shall be provided for cutting off the ballast system from the tanks containing fuel as well as for cutting off the fuel system from fuel tanks containing water.

11 Protection against noise

Measures shall be taken to reduce the effects of noise upon personnel in machinery spaces to levels as given in the IMO Code on Noise Levels on Board Ships12.

12 Steering gear

1 Vessels shall be provided with a main steering gear and an auxiliary means of actuating the rudder in compliance with the rules of a recognized organization. The main steering gear and the auxiliary means of actuating the rudder shall be arranged so that so far as is reasonable and practicable a single failure in one of them will not render the other one inoperative.

2 Where the main steering gear comprises two or more identical power units an auxiliary steering gear need not be fitted if the main steering gear is capable of operating the rudder as required by paragraph 10 when any one of the units is out of operation. Each of the power units shall be operated from a separate circuit.

3 The position of the rudder, if power operated, shall be indicated in the wheelhouse. The rudder angle indication for power-operated steering gear shall be independent of the steering gear control system.

4 In the event of failure of any of the steering gear units an alarm shall be given in the wheelhouse.

5 Indicators for running indication of the motors of electric and electrohydraulic steering gear shall be installed in the wheelhouse. Short circuit protection, an overload alarm and a no-voltage alarm shall be provided for these circuits and motors. Protection against excess current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of the appropriate starting currents.

6 The main steering gear shall be of adequate strength and sufficient to steer the vessel at maximum service speed. The main steering gear and rudder stock shall be so designed that they will not be damaged at maximum speed astern or by manoeuvring during fishing operations.

7 The main steering gear shall, with the vessel at its maximum permissible operating draught, be capable of putting the rudder over from 35° on one side to 35° on the other side with the vessel running ahead at maximum service speed. The rudder shall be capable of being put over from 35° on either side to 30° on the other side in not more than 28 s, under the same conditions. The main steering gear shall be operated by power where necessary to fulfil these requirements.

8 The main steering gear power unit shall be arranged to start either by manual means in the wheelhouse or automatically when power is restored after a power failure.

9 The auxiliary means for actuating the rudder shall be of adequate strength and sufficient to steer the vessel at navigable speed and capable of being brought speedily into action in an emergency.

10 The auxiliary means for actuating the rudder shall be capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 s with the vessel running at one-half of its maximum service speed ahead or 7 knots whichever is the greater. The auxiliary

means for actuating the rudder shall be operated by power where necessary to fulfil these requirements.

11 Electric or electrohydraulic steering gear in vessels of 75 m in length and over shall be served by at least two circuits fed from the main switchboard and these circuits shall be as widely separated as possible.

13 Engineers' alarm

In vessels of 75 m in length and over an engineers' alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate, and shall be clearly audible in the engineers' accommodation.

14 Refrigeration systems for the preservation of the catch

1 Refrigeration systems shall be so designed, constructed, tested and installed as to take account of the safety of the system and also the emission of chlorofluorocarbons (CFCs) or any other ozone-depleting substances from the refrigerant held in quantities or concentrations which are hazardous to human health or to the environment, and shall be to the satisfaction of the Administration.

2 Refrigerants to be used in refrigeration systems shall be to the satisfaction of the Administration. However, methylchloride or CFCs whose ozone-depleting potential is higher than 5% of CFC-11 shall not be used as refrigerants.

3 If ammonia is to be used as the refrigerant gas, the refrigerating plant shall be arranged so as to take account of the relevant internationally recommended practice.

4 Refrigerating installations shall be adequately protected against vibration, shock, expansion, shrinkage, etc. and shall be provided with an automatic safety control device to prevent a dangerous rise in temperature and pressure.

5 Refrigeration systems in which toxic or flammable refrigerants are used shall be provided with drainage devices leading to a place where the refrigerant presents no danger to the vessels or to persons on board.

6 Any space containing refrigerating machinery including condensers and gas tanks utilizing toxic refrigerants shall be separated from any adjacent space by gastight bulkheads. Any space containing the refrigerating machinery including condensers and gas tanks shall be fitted with a leak detection system having an indicator outside the space adjacent to the entrance and shall be provided with an independent ventilation system.

7 Spaces containing condensers, gas tanks and refrigeration machinery utilizing toxic refrigerants, such as ammonia, shall be provided with a water spray system.

8 When it is not practicable to contain refrigeration machinery in a separate place due to the size of the vessel, the refrigeration system may be installed in the machinery space provided that the quantity of refrigerant used will not cause danger to persons in the machinery space, should all the gas escape, and provided that an alarm is fitted to give warning of a dangerous concentration of gas should any leakage occur in the compartment.

9 In refrigerating machinery spaces and refrigerating rooms, alarms shall be connected to the wheelhouse or control stations or escape exits to prevent persons being trapped. At least one exit from each such space shall be capable of being opened from the inside. Where practicable, exits from the spaces containing refrigerating machinery using toxic or flammable gas shall not lead directly into any accommodation spaces.

10 Where any refrigerant harmful to persons is used in a refrigeration system, at least two sets of breathing apparatus shall be provided, one of which shall be placed in a position not likely to become inaccessible in the event of leakage of refrigerant. Breathing apparatus provided as part of the vessel's fire-fighting equipment may be considered as meeting all or part of this provision provided its location meets both purposes. Where self- contained breathing apparatus is used, spare cylinders shall be provided.

11 Adequate guidance for the safe operation and emergency procedures for the refrigeration system shall be provided by suitable notices displayed on board the vessel.

PART C – ELECTRICAL INSTALLATIONS

15 Main source of electrical power

Where electrical power constitutes the only means of maintaining auxiliary services essential for the propulsion and safety of the vessel, a main source of electric power shall be provided which shall, as far practicable, include two generating sets, one of which may be driven by the main engine. The Administration may accept other arrangements having equivalent electrical capacity.

16 Emergency source of electrical power

1 A self-contained emergency source of electrical power shall be located outside the machinery spaces above the main deck. It shall be so arranged as to ensure that it would function in the event of fire or other causes of failure of the main electrical installations.

2 The emergency source of electrical power, which may be either a generator or an accumulator battery, shall be capable, having regard to starting current and the transitory nature of certain loads, of serving simultaneously, for a period of at least three hours:

.1 a VHF radio installation or an MF radio installation or a ship-earth station or an MF/HF radio installation depending on the sea area for which the vessel is to be equipped;

.2 internal communication equipment, fire detecting systems and signals, which may be required in an emergency; and

.3 the navigational lights if solely electrical and the emergency lights:

.1 at launching stations and over the side of the vessel;

.2 in all alleyways, stairways and exits;

.3 in spaces containing machinery or the emergency source of power;

.4 in control stations; and

.5 in fish handling and fish processing spaces.

.4 the operation of the emergency fire pump, if any.

3 The arrangements for the emergency source of electrical power shall comply with the following:

.1 Where the emergency source of electrical power is a generator, it shall be provided with an independent fuel supply and with efficient starting arrangements. Unless a second independent means of starting the emergency generator is provided, the single source of stored energy shall be protected to preclude its complete depletion by the automatic starting system.

.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of carrying the emergency load without recharging whilst maintaining the voltage of the battery throughout the discharge period within plus or minus 12% of its nominal voltage. In the event of failure of the main power supply, this accumulator battery shall be automatically connected to the emergency switchboard and shall immediately supply at least those services specified in paragraph 2. The emergency switchboard shall be provided with an auxiliary switch allowing the battery to be connected manually in case of failure of the automatic connection system.

4 The emergency switchboard shall be installed as near as is practicable to the emergency source of power and shall be located in accordance with paragraph 1. Where the emergency source of power is a generator, the emergency switchboard shall be located in the same place unless the operation of the emergency switchboard would thereby be impaired.

5 Any accumulator battery shall be installed in a well-ventilated space, but not in the space containing the emergency switchboard. An indicator shall be mounted in a suitable space on the main switchboard or in the machinery control room to indicate when the battery constituting the emergency source of power is being discharged. The emergency switchboard shall be supplied in normal operation from the main switchboard by an inter- connector feeder protected at the main switchboard against overload and short circuit. The arrangement at the emergency switchboard shall be such that in the event of a failure of the main power supply an automatic connection of emergency supply will be provided. When the system is arranged for feed-back operation, the inter-connector feeder shall also be protected at the emergency switchboard against short circuit.

6 An emergency generator and its prime mover and any accumulator battery shall be so arranged as to ensure that they will function at full rated power when the vessel is upright and when rolling up to an angle of 22.5^{o} either way and simultaneously pitching 10^{o} by bow or stern, or is in any combination of angles within those limits.

7 Battery level indicators shall be mounted in a highly visible position on the main switchboard or in the machinery control room to facilitate monitoring of the condition of batteries constituting the emergency source of supply as well as any batteries required for the starting of an independent, power driven emergency generator.

8 The emergency source of electrical power and automatic starting equipment shall be so constructed and arranged as to enable adequate testing to be carried out by the crew while the vessel is in operating condition.

17 Precautions against shock, fire and other hazards of electrical origin

1 Electric circuits shall be clearly identified on switchboards.

2 Electrical equipment exposed to the weather shall be protected from dampness and corrosion as well as mechanical damage.

3 Piping conveying steam or liquid shall not be fitted above or in the vicinity of switchboards or other electrical equipment. Where such arrangements are unavoidable, provision shall be made to prevent leakage damaging the equipment.

4 Exposed permanently fixed metal parts of electrical machines or equipment which are not intended to be "live", but which are liable under fault conditions to become "live", shall be earthed (grounded) unless:

.1 they are supplied at a voltage not exceeding 55 V direct current or 55 V; root mean square, between conductors; autotransformers shall not be used for the purpose of achieving this alternative current voltage; or

.2 they are supplied at a voltage not exceeding 250 V by safety isolating transformers supplying one consuming device only; or

.3 they are constructed taking into account the principle of double insulation.

5 Portable electrical equipment shall operate at a safe voltage, exposed metal parts of such equipment which are not intended to have a voltage but which may have such under fault conditions, shall be earthed. The Administration may require additional precautions for portable electric lamps, tools or similar apparatus for use in confined or exceptionally damp spaces, where particular risks due to conductivity may exist.

6 Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to attendants. The sides and backs and, where necessary, the fronts of switchboards, shall be suitably guarded. Exposed "live" parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. There shall be non-conducting mats or gratings at the front and rear, where necessary.

7 In vessels of 75 m in length and over, the hull return system of distribution shall not be used for power, heating or lighting in general. However, the requirement does not preclude, under conditions approved by the Administration, the use of:

.1 impressed current cathodic protective system;

.2 limited locally earthed systems; or

.3 insulation level monitoring devices, provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

Where the hull return system is used, all final sub-circuits (all circuits fitted after the last protective device) shall be two wires, and special precautions shall be taken to the satisfaction of the Administration.

8 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

9 Where the cables are neither sheathed nor armoured and there might be a risk of fire in the event of an electrical fault, special precautions shall be taken to the satisfaction of the Administration.

10 All electrical cables shall be at least of a flame-retardant type and shall be so installed as not to impair their original flame-retarding properties. The Administration may permit the use of special types of cables, when necessary for particular applications, such as radio frequency cables, which do not apply with the foregoing.

11 Lighting fittings shall be arranged to prevent temperature rises which could damage the wiring and to prevent surrounding material from becoming excessively hot.

12 Wiring shall be supported in such a manner as to avoid chafing or other damage and shall not be located close to hot surfaces such as engine exhausts.

13 Each separate circuit shall be protected against short circuit and also against overload to the satisfaction of the Administration, except in accordance with paragraph 12, or where the Administration may exceptionally otherwise permit.

14 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

15 The housing of an accumulator battery shall be constructed and ventilated to the satisfaction of the Administration.

16 Electrical and other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in 18.

17 An accumulator battery shall not be located in accommodation spaces unless installed in a hermetically sealed container.

18 In spaces, where flammable mixtures are liable to collect, and in any compartment assigned principally to the containment of an accumulator battery, no electrical equipment shall be installed unless the Administration is satisfied that it is:

.1 essential for operational purposes;

.2 of a type which will not ignite the mixture concerned;

.3 appropriate to the space concerned; and

.4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

19 Where a potential explosion risk exists in or near any space, all electrical equipment and fittings installed in those spaces shall be either explosion-proof or intrinsically safe to the satisfaction of the Administration.

20 Cable systems and electrical equipment shall be so installed as to avoid or reduce interference with radio reception.

PART D – PERIODICALLY UNATTENDED MACHINERY SPACES

18 Fire safety

Fire prevention

1 Special consideration shall be given to high-pressure fuel oil pipes. Where practicable, leakages from such piping systems shall be collected in a suitable drain tank which shall be provided with a high level alarm.

2 Where daily service fuel oil tanks are filled automatically or by remote control, means shall be provided to prevent overflow spillages. Similar consideration shall be given to other equipment which treats flammable liquids automatically.

3 Where fuel oil daily service tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the fuel oil can be exceeded.

Fire detection

4 An approved fire detection system based on a self-monitoring principle and including facilities for periodical testing shall be installed in machinery spaces.

5 The detection system shall initiate both audible and visual alarm in the wheelhouse and in sufficient appropriate spaces to be heard and observed by persons on board, when the vessel is in harbour.

6 The fire detection system shall be fed automatically from an emergency source of power if the main source of power fails.

7 Internal combustion engines of 2,500 kW and over shall be provided with crankcase oil mist detectors or engine bearing temperature detectors or equivalent devices.

Fire fighting

8 A fixed fire-extinguishing system shall be provided, which shall be in compliance with the provisions of paragraph 13 of chapter 5.

9 In vessels of 75 m in length and over, provisions shall be made for immediate water delivery from the fire main system either by:

.1 remote starting arrangements of one of the main fire pumps in the wheelhouse and the fire control station, if any; or

.2 permanent pressurization of the fire main system, due regard being paid to the possibility of freezing.

10 The Administration shall be satisfied with the maintenance of the fire integrity of the machinery spaces, the location and centralization of the fire-extinguishing system controls, the shut-down arrangements, (e.g. ventilation, fuel pumps, etc.) and may require fire extinguishing appliances and other fire fighting equipment and breathing apparatus in addition to the relevant provisions of chapter 5.

19 Protection against flooding

1 Bilges in machinery spaces shall be provided with a high level alarm in such a way that the accumulation of liquids is detected at normal angles of trim and heel. The detection system shall initiate an audible and visual alarm in the places where continuous watch is maintained.

2 The controls of any valve serving a sea inlet or discharge below the waterline or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space.

20 Communications

In vessels of 75 m in length and over, one of the two separate means of communication referred to in paragraph 6 shall be a reliable vocal communication. An additional reliable means of vocal communication shall be provided between the wheelhouse and the engineers' accommodation.

21 Alarm system

1 An alarm system shall be provided in order to indicate any fault requiring attention.

2 The alarm system shall be capable of sounding an audible alarm in the machinery space and shall indicate visually each separate alarm function at a suitable position. However, the Administration may permit the system to be capable of sounding and indicating visually each separate alarm function in the wheelhouse only.

3 Audible and visual alarms shall be activated in the wheelhouse for any situation requiring action by the responsible person on watch or which shall be brought to his attention.

4 The alarm system shall, as far as is practicable, be designed on the fail-safe principle.

5 The alarm system shall be:

.l continuously powered with automatic change-over to a stand-by power supply in case of loss of normal power supply; and

.2 activated by failure of the normal power supply.

6 The alarm system shall be able to indicate at the same time more than one fault and the acceptance of any alarm shall not inhibit another alarm.

7 Acceptance at the position referred to in 2 of any alarm condition shall be indicated at the positions where it was shown. Alarms shall be maintained until they are accepted and the visual indications shall remain until the fault has been corrected. All alarms shall automatically reset when the fault has been rectified.

22 Special requirements for machinery, boiler and electrical installations

1 In vessels of 75 m in length and over, the main source of electrical power shall comply with the applicable provisions of the Protocol.

2 Where required to be duplicated, other auxiliary machinery essential to propulsion shall be fitted with automatic change-over devices allowing transfer to a standby machine. An alarm shall be given on automatic change-over.

3 Automatic control and alarm systems shall be provided as follows:

.1 the control system shall be such that through the necessary automatic arrangements the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured;

.2 means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion;

.3 an alarm system complying with paragraph 21 shall be provided for all important pressures, temperatures, fluid levels, etc.; and

.4 where appropriate, an adequate central position shall be arranged with the necessary alarm panels and instrumentation indicating any alarmed fault.

23 Safety system

A safety system shall be provided so that serious malfunction in machinery or boiler operations, which presents an immediate danger, shall initiate the automatic shut-down of that part of the plant and an alarm shall be given. Shut-down of the propulsion system shall not be automatically activated except in cases which could lead to serious damage, complete breakdown, or explosion. Where arrangements for overriding the shutdown of the main propelling machinery are fitted, these shall be such as to preclude inadvertent activation. Visual means shall be provided to show whether or not it has been activated.

CHAPTER 5
FIRE PROTECTION AND FIRE FIGHTING
PART A – GENERAL FIRE PROTECTION PROVISIONS

1 Application to existing ships

The provisions of paragraphs 13.1, 13.2, 20 to 28, 33.1, 33.2, 38 to 45, 50.1, 50.2, 55 to 62 shall also apply to existing ships.

2 General

One of the following methods of protection shall be adopted in accommodation and service spaces:

.1 Method IF - The construction of all internal divisional bulkheads of non-combustible "B" or "C" class divisions generally without the installation of a detection or sprinkler system in the accommodation and service spaces; or

.2 Method IIF - The fitting of an automatic sprinkler and fire alarm system for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads; or

.3 Method IIIF - The fitting of an automatic fire alarm and detection system in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads, except that in no case shall the area of any accommodation space or spaces bounded by an "A" or "B" class division exceed 50 m^2. However, the Administration could increase this area for public spaces. The recommendations for the use of non-combustible materials in construction and insulation for the boundary bulkheads of machinery spaces, control stations, etc. and the protection of stairway enclosures and corridors are common to all three methods.

3 Definitions

1 "A" class divisions are those divisions formed by bulkheads and decks, which comply with the following:

.1 they are constructed of steel or other equivalent material;

.2 they are suitably stiffened;

.3 they are so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and

.4 they are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140ºC above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180ºC above the original temperature, within the time listed below:

class "A-60" 60 min

class "A-30" 30 min

class "A-15" 15 min

class "A-0" 0 min

The Administration may require a test of a prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise in accordance with the Fire Test Procedures Code.

2 Accommodation spaces are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms and pantries containing no cooking appliances and similar spaces.

3 "B" class divisions are those divisions formed by bulkheads, decks, ceilings, or linings, which comply with the following:

.1 they are so constructed as to be capable of preventing the passage of flame to the end of the first one-half hour of the standard fire test;

.2 they have an insulation value such that the average temperature of the unexposed side will not rise more than 140ºC above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225ºC above the original temperature, within the time listed below:

class "B-15" 15 min

class "B-0" 0 min; and

.3 they are constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions are non-combustible with the exception that combustible veneers could be permitted provided they meet the relevant recommendations of this chapter.

The Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise in accordance with the Fire Test Procedures Code.

4 "C" class divisions are those divisions constructed of approved non-combustible materials. They do not need to meet requirements relative to the passage of smoke and flame nor the limiting of temperature rise. Combustible veneers could be used provided they meet other requirements of this chapter.

5 Continuous "B" class ceilings or linings are those "B" class ceilings or linings, which terminate only at an "A" or "B" class division.

6 Control stations are those spaces in which the vessel's radio or main navigation equipment or the emergency source of power is located, or where the fire recording or fire control equipment is centralized.

7 "F" class divisions are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

.1 they are so constructed as to be capable of preventing the passage of flame to the end of the first one-half hour of the standard fire test; and

.2 they have an insulation value such that the average temperature of the unexposed side will not rise more than 140ºC above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225ºC above the original temperature, up to the end of the first one-half hour of the standard fire test.

The Administration may require a test of a prototype division to ensure that it meets the above requirements for integrity and temperature rise in accordance with the Fire Test Procedures Code.

8 Fire Safety Systems Code means the International Code for Fire Safety Systems, adopted by the Maritime Safety Committee of IMO by resolution MSC.98(73), as may be amended by IMO.

9 Fire Test Procedures Code means the International Code for Application of Fire Test Procedures, adopted by the Maritime Safety Committee of IMO by resolution MSC.61(67), as may be amended by IMO.

10 Low flame-spread means that the surface thus described will adequately restrict the spread of flame, to the satisfaction of the Administration by an established test procedure.

11 Machinery spaces are those machinery spaces of category A and all other spaces containing propulsion machinery, boilers, fuel oil units, steam and internal combustion engines, generators, steering gear, major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilating and air conditioning machinery and similar spaces, and trunks to such spaces.

12 Machinery spaces of category A are those spaces and trunks to such spaces, which contain internal combustion type machinery, used either:

.1 for main propulsion; or

.2 for other purposes where such machinery has, in the aggregate, a total power output of not less than 750 kW,

or which contain any oil-fired boiler or fuel oil unit.

13 Non-combustible material means a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750ºC, this being determined in accordance with the Fire Test Procedures Code. Any other material is a combustible material.

14 Public spaces are those portions of the accommodation spaces, which are used for halls, dining rooms, lounges, and similar permanently enclosed spaces.

15 Service spaces are those spaces used for galleys, pantries containing cooking appliances, lockers and store-rooms, workshops other than those forming part of the machinery spaces and similar spaces and trunks to such spaces.

16 A standard fire test is one in which specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve specified in the Fire Test Procedures Code.

17 Steel or other equivalent material means steel or any material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable fire exposure to the standard fire test (e.g., aluminium alloy with appropriate insulation).

PART B – FIRE SAFETY MEASURES IN VESSELS OF A LENGTH OF 60 M AND OVER

4 Structure

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material except as otherwise specified in 4.

2 The insulation of aluminium alloy components of "A" or "B" class divisions, except structures which, in the opinion of the Administration, are non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200ºC above the ambient temperature at any time during the applicable fire exposure to the standard fire test.

3 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support survival craft stowage, launching and embarkation areas, and "A" and "B" class divisions, to ensure:

.1 that for such members supporting survival craft areas and "A" class divisions, the temperature rise limitation specified in 2 shall apply at the end of one hour; and

.2 that for such members required to support "B" class divisions, the temperature rise limitation specified in 2 shall apply at the end of one half- hour.

4 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and any openings therein shall be suitably arranged and protected to prevent the spread of fire.

5 Bulkheads within the accommodation and service spaces

1 Within the accommodation and service spaces, all bulkheads required to be "B" class divisions shall extend from deck to deck and to the shell or other boundaries. Unless continuous "B" class ceilings or linings, or both, are fitted on both sides of the bulkheads, the bulkhead could terminate at the continuous ceiling or lining.

2 Method IF. All bulkheads not required by this or other sections of this Part to be "A" or "B" class divisions shall be at least "C" class divisions.

3 Method IIF. There shall be no restriction on the construction of bulkheads not required by this or other sections of this part to be "A" or "B" class divisions except in individual cases where "C" class bulkheads are required in accordance with table l in paragraph 8.

4 Method IIIF. There shall be no restriction on the construction of bulkheads not required by this or other sections of this part to be "A" or "B" class divisions. In no case, shall the area of any accommodation space or spaces bounded by a continuous "A" or "B" class division exceed 50 m², except in individual cases where "C" class bulkheads are required in accordance with table l in paragraph 8. However, the Administration may increase this area for public spaces.

6 Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

1 Stairways which penetrate only a single deck shall be protected at least at one level by at least “B-0” class divisions and self-closing doors. Lifts which penetrate only a single deck shall be enclosed by “A-0” class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be enclosed by at least “A- 0” class divisions and protected by self-closing doors at all levels.

2 All stairways shall be of steel frame construction except where the Administration permits the use of other equivalent material.

7 Doors in fire-resistant divisions

1 Doors shall have resistance to fire as far as practicable, equivalent to the division in which they are fitted. Doors and doorframes in “A” class divisions shall be constructed of steel. Doors in “B” class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be self-closing and reasonably gastight. The Administration could permit the use of combustible materials in doors separating cabins from the individual interior sanitary accommodation, such as showers, if constructed according to Method IF.

2 Doors required to be self-closing shall not be fitted with holdback hooks. However, holdback arrangements fitted with remote release fittings of the fail-safe type could be used.

3 Ventilation openings can be permitted in and under the doors in corridor bulkheads except that such openings are not permitted in and under stairway enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m^2. When such opening is cut in a door, it shall be fitted with a grille made of non-combustible material.

4 Watertight doors need not be insulated.

8 Fire integrity of bulkheads and decks

1 In addition to the specific provisions for fire integrity of bulkheads and decks required elsewhere in this part, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables l and 2 of this section.

2 The following requirements shall govern application of the tables:

.1 tables l and 2 apply respectively to bulkheads and decks separating adjacent spaces; and

.2 for determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as follows:

(1) Control stations

Spaces containing emergency sources of power and lighting. Wheelhouse and chartroom.

Spaces containing the vessel's radio equipment.

Fire-extinguishing rooms, fire-control rooms and fire recording stations.

Control room for propulsion machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) Corridors

Corridors and lobbies.

(3) Accommodation spaces

Spaces as defined in paragraphs 3.14 and 3.11 excluding corridors.

(4) Stairways

Interior stairways, lifts and escalators other than those wholly contained within the machinery spaces and enclosures thereto. In this connection, a stairway, which is enclosed only at one level, is to be regarded as part of the space from which it is not separated by a fire door.

(5) Service spaces of low fire risk

Lockers and storerooms having areas of less than 2 m^2 and laundries.

(6) Machinery spaces of category A Spaces as defined in paragraph 3.12.

(7) Other machinery spaces

Spaces as defined in paragraph 3.11 including fishmeal processing spaces, but excluding machinery spaces of category A.

(8) Cargo spaces

All spaces used for cargo, including cargo oil tanks, and trunkways and hatchways to such spaces.

(9) Service spaces of high fire risk

Galleys, pantries containing cooking appliances, paint rooms, lamp rooms, lockers and store-rooms having areas of 2 m^2 or more, and workshops other than those forming part of the machinery spaces.

(10) Open decks

Open deck spaces and enclosed promenades, spaces for processing fish in the raw state, fish washing spaces and similar spaces containing no fire risk. The air spaces outside superstructures and deckhouses.

The title of each category is intended to be typical rather than restrictive. The number in parenthesis following each category refers to the applicable column or row in the tables.

Table 1 Fire integrity of bulkheads separating adjacent spaces

Spaces	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Control stations (1)	A-0 [e]	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0[c]	B-0	A-60	A-0	A-0	A-0	*
Accommodation spaces (3)			C[a,b]	B-0 A-0[c]	B-0	A-60	A-0	A-0	A-0	*
Stairways (4)				B-0 A-0[c]	B-0 A-0[c]	A-60	A-0	A-0	A-0	*
Service spaces of low fire risk (5)					C	A-60	A-0	A-0	A-0	*
Machinery spaces of category A (6)						*	A-0	A-0	A-60	*
Other machinery spaces (7)							A-0[d]	A-0	A-0	*
Cargo spaces (8)								*	A-0	*
Service spaces of high fire risk (9)									A-0[d]	*
Open decks (10)										-

Table 2 Fire integrity of decks separating adjacent spaces

Space above → Space below ↓	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*
Accommodation (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*
Service spaces of low fire risk (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60	A-30	A-60	*
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*
Service spaces of high fire risk (9)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0[f]	*
Open decks (10)	*	*	*	*	*	*	*	*	*	-

* Notes: To be applied to both tables 1 and 2, as appropriate

(a) No special requirements are imposed upon these bulkheads in Methods IIF and IIIF fire protection.

(b) In case of Method IIIF, "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m^2 and over in area.

(c) For clarification as to which applies, see paragraphs 5 and 6.

(d) Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g., in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A- 0" bulkhead.

(e) Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

(f) Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the Administration, has little or no fire risk.

Where an asterisk appears in the tables, the division shall be of steel or equivalent material, but does not need to be of "A" class standard. However, where a deck is penetrated for the passage of electrical cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke.

3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, can be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4 Windows and skylights to machinery spaces shall be as follows:

.1 where skylights can be opened, they shall be capable of being closed from outside the space. Skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material permanently attached;

.2 glass or similar materials shall not be fitted in machinery space boundaries.

This does not preclude the use of wire-reinforced glass for skylights and glass in control rooms within the machinery spaces; and

.3 skylights referred to in 4.1 shall be of wire-reinforced glass.

5 External boundaries which are required by paragraph 4.1 to be of steel or equivalent material can be pierced for the fitting of windows and sidescuttles provided that there is no requirement elsewhere in this part for such boundaries to have "A" class integrity. Similarly, in such boundaries, which are not required to have "A" class integrity, doors may be of materials to the satisfaction of the Administration.

9 Details of construction

1 Method IF. In accommodation and service spaces and control stations, all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials.

2 Methods IIF and IIIF. In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings, linings, draught stops and their associated grounds shall be of non-combustible materials.

3 Methods IF, IIF and IIIF

.1 Except in cargo spaces or refrigerated compartments of service spaces insulating materials shall be non-combustible. Vapour barriers and adhesives used in

conjunction with insulation, as well as the insulation of pipe fittings, for cold service systems need not be of non-combustible material, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration. In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapour.

.2 Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces, they can have a combustible veneer not exceeding 2 mm in thickness within any such space except corridors, stairway enclosures and control stations, where it shall not exceed 1.5 mm in thickness.

.3 Air spaces enclosed behind ceilings, panellings or linings shall be divided by close-fitting draught stops spaced not more than 14 m apart. In the vertical direction, such spaces, including those behind linings of stairways, trunks, etc., shall be closed at each deck.

10 Ventilation systems

1 Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross section not exceeding 0.02 m^2 need not be non-combustible, subject to the following conditions:

.1 these ducts are of a material, which to the satisfaction of the Administration, has a low fire risk;

.2 they are only used at the end of the ventilation device; and

.3 they are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

2 Where the ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "A" class bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and comply in that portion of the duct with the following:

.1 for ducts with a free cross-sectional area exceeding 0.02 m^2, the sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall preferably be divided evenly on each side of the bulkhead. Ducts with free cross-sectional area exceeding 0.02 m^2 shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection shall be provided to the satisfaction of the Administration; and

.2 ducts with a free cross-sectional area exceeding 0.085 m^2 shall be fitted with fire dampers in addition to the requirements of 2.1. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions,

without serving those spaces, provided those ducts have the same fire integrity as the bulkheads which they penetrate.

3 Ventilation ducts for machinery spaces of category A or galleys shall not, in general, pass through accommodation spaces, service spaces or control stations. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and so arranged as to preserve the integrity of the divisions.

4 Ventilation ducts of accommodation spaces, service spaces or control stations shall not, in general, pass through machinery spaces of category A or through galleys. Where the Administration permits this arrangement the ducts shall be constructed of steel or equivalent material and so arranged as to preserve the integrity of the divisions.

5 Where ventilation ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "B" class bulkheads, the openings shall be lined with steel sheet sleeves of at least 900 mm in length, unless the ducts are of steel for this length in way of the bulkheads. When passing through a "B" class bulkhead this length shall preferably be divided evenly on each side of the bulkhead.

6 Practical measures shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements are equally effective.

7 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

.1 a grease trap readily removable for cleaning;

.2 a fire damper located in the lower end of the duct;

.3 arrangements, operable from within the galley, for shutting off the exhaust fan; and

.4 fixed means for extinguishing a fire within the duct, except where the Administration considers such fittings impractical in a vessel of less than 75 m in length.

8 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. Power ventilation of accommodation spaces, service spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position shall not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

9 Means shall be provided for closing, from a safe position, the spaces around funnels.

10 Ventilation systems serving machinery spaces shall be independent of systems serving other spaces.

11 Store-rooms containing appreciable quantities of highly flammable products shall be provided with ventilation arrangements, which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators shall be positioned in safe areas and fitted with spark arresters.

11 Heating installations

1 Electric radiators shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

2 Heating by means of open fires shall not be permitted. Heating stoves and other similar appliances shall be firmly secured and adequate protection and insulation against fire shall be provided beneath and around such appliances and in way of their uptakes. Uptakes of stoves, which burn solid fuel shall be so arranged and designed as to minimize the possibility of becoming blocked by combustion products and shall have a ready means for cleaning. Dampers for limiting draughts in uptakes shall, when in the closed position, still leave an adequate area open. Spaces in which stoves are installed shall be provided with ventilators of sufficient area to provide adequate combustion-air for the stove. Such ventilators shall have no means of closure and their position shall be such that closing appliances in accordance with paragraph 9 of chapter 2 are not required.

3 Open flame gas appliances, except cooking stoves and water heaters, shall not be permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe place. All pipes conveying gas from container to stove or water heater shall be of steel or other approved material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance.

4 Where gaseous fuel is used for domestic purposes, the arrangements, storage, distribution and use of the fuel shall be to the satisfaction of the Administration and in accordance with paragraph 13.

12 Miscellaneous items

1 All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame-spread characteristics.Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame-spread characteristics.

2 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours, to be determined in accordance with the Fire Test Procedures Code.

3 Primary deck coverings within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with the Fire Test Procedures Code.

4 Where “A” or “B” class divisions are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire integrity of the divisions is not impaired.

5 In accommodation and service spaces and control stations, pipes penetrating “A” or “B” class divisions shall be of approved materials having regard to the temperature that such divisions are required to withstand. Where the Administration permits the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of an approved material having regard to the fire risk.

6 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

7 Cellulose-nitrate-based film shall not be used in cinematography installations.

8 All waste receptacles other than those used in fish processing shall be constructed of non-combustible materials with no openings in the sides or bottom.

9 Machinery driving fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they can be stopped in the event of a fire arising in the space in which they are located.

10 Drip trays shall be fitted, where necessary, to prevent oil leaking into bilges.

11 Within compartments used for stowage of fish, combustible insulation shall be protected by close-fitting cladding.

13 Storage of gas cylinders and dangerous materials

1 Cylinders for compressed, liquefied, or dissolved gases shall be clearly marked by means of prescribed identifying colours; have a clearly legible identification of the name and chemical formula of their contents; and shall be properly secured.

2 Cylinders containing flammable or other dangerous gases and empty cylinders shall be stored, properly secured, on open decks and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Cylinders shall be protected against excessive variations in temperature, direct rays of the sun and accumulation of snow. However, the Administration may permit such cylinders to be stored in compartments complying with the requirements of 3 to 5.

3 Spaces containing highly flammable liquids, such as volatile paints, paraffin, benzole, etc. and, where permitted, liquefied gas, shall have direct access from open decks only. Pressure adjusting devices and relief valves shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they shall be gastight.

4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be to the satisfaction of the Administration for use in a flammable atmosphere. Sources of heat shall be kept clear of such spaces and "No Smoking" and "No Naked Light" notices shall be displayed in a prominent position.

5 Separate storage shall be provided for each type of compressed gas. Compartments used for the storage of such gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system. However, the Administration may relax these requirements considering the characteristics, volume and intended use of such compressed gases.

14 Means of escape

1 Stairways and ladders leading to and from all accommodation spaces and in spaces, in which the crew is normally employed, other than machinery spaces, shall be so arranged as to provide ready means of escape to the open deck and thence to the survival craft. In particular, in relation to these spaces:

.1 at all levels of accommodation at least two widely separated means of escape shall be provided which may include the normal means of access from each restricted space or group of spaces;

.2.1 below the weather deck, the main means of escape shall be a stairway and the second escape may be a trunk or a stairway; and

.2.2 above the weather deck, the means of escape shall be stairways or doors to an open deck or a combination thereof;

.3 exceptionally, the Administration may permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be accommodated or employed there;

.4 a corridor or part of a corridor from which there is only one route of escape, shall not exceed 7 m in length; and

.5 the width and continuity of the means of escape shall be to the satisfaction of the Administration.

2 Two means of escape shall be provided from every machinery space of category A by one of the following means:

.1 two sets of steel ladders, as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require such shelter if, due to special arrangements or dimensions of the machinery space, a safe escape route from the lower part of this space is provided. This shelter shall be of steel, insulated and be provided with a self-closing steel door at the lower end; or

.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.

3 From machinery spaces other than those of category A, escape routes shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space.

4 Lifts shall not be considered as forming one of the required means of escape.

15 Automatic sprinkler and fire alarm and fire detection systems (Method IIF)

1 In vessels, in which method IIF is adopted, an automatic sprinkler and fire alarm system of an approved type and complying with the requirements of this section shall be installed and so arranged as to protect accommodation spaces and service spaces except spaces which afford no substantial fire risks, such as void spaces and sanitary spaces.

2 The system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections can be of the dry pipe type where, in the opinion of the Administration, this is a necessary precaution. Any parts of the system which may be subjected to freezing temperatures in service shall be suitably protected against freezing.It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in 13.

3 Each section of sprinklers shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such units shall indicate in which section served by the system, fire has occurred and shall be centralized in the wheelhouse and, in addition, visible and audible alarms from the unit shall be placed in a position other than in the wheelhouse, so as to ensure that the indication of fire is immediately received by the crew. Such an alarm system shall be so constructed as to indicate if any fault occurs in the system.

4 Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers.

5 Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person.

6 A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.

7 The sprinklers shall be resistant to corrosion. In accommodation and service spaces, the sprinklers shall come into operation within the temperature range of 68ºC and 79ºC, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature can be increased by not more than 30ºC above the maximum deck head temperature.

8 A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

9 Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 l per m^2 per minute over the nominal area covered by the sprinklers. Alternatively, the Administration may permit the use of sprinklers providing such quantity of water suitably distributed as has been shown to be not less effective.

10 A pressure tank having a volume equal to at least twice that of the charge of water specified in this subparagraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in 13 and the arrangements shall provide for maintaining such air pressure in the tank as to ensure that, where the standing charge of fresh water in the tank has been used, the pressure will be not less than the working pressure of the sprinkler, plus the pressure due to a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

11 Means shall be provided to prevent the passage of seawater into the tank.

12 An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.

13 The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of the maximum area separated by fire-resisting bulkheads of “A” and “B” class divisions or an area of 280 m^2 whichever is the less at the application rate specified in 9.

14 The pump shall be fitted, on the delivery side a test valve, with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in 10.

15 The sea inlet to the pump shall, wherever possible, be in the space containing the pump and shall be so arranged that, when the vessel is afloat, it will not be necessary to shut off the supply of seawater to the pump for any purpose other than the inspection or repair of the pump.

16 The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of category A and shall not be situated in any space required to be protected by the sprinkler system.

17 There shall not be less than two sources of power supply for the seawater pump and the automatic fire alarm and fire detection system. If the pump is electrically driven it shall be

connected to the main source of electrical power, which shall be capable of being supplied by at least two generators.

18 The feeders shall be arranged so as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk, except in so far as it is necessary to reach the appropriate switchboard. One of the sources of power supply for the fire alarm and fire detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion-type engine, it shall, in addition to complying with the provisions of 16, be so situated that a fire in any protected space will not affect the air supply to that engine.

19 The sprinkler system shall have a connection from the vessel's fire main by way of a lockable screw-down non-return valve at the connection, which will prevent a backflow from the sprinkler system to the fire main.

20 A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section.

21 Means shall be provided for testing the automatic operation of the pump on reduction of pressure in the system.

22 Switches shall be provided at one of the indicating positions referred to in 3, which will enable the alarm and the indicators for each section of sprinklers to be tested.

23 Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration.

16 Automatic fire alarm and fire detection systems (Method IIIF)

1 In vessels, in which Method IIIF is adopted, an automatic fire alarm and fire detection system of an approved type and complying with the requirements of this section shall be installed and so arranged as to detect the presence of fire in all accommodation spaces and service spaces except spaces which afford no substantial fire risk, such as void spaces and sanitary spaces.

2 The system shall be capable of immediate operation at all times and no action of the crew shall be necessary to set it in operation.

3 Each section of detectors shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any detector comes into operation. Such units shall indicate in which section served by the system a fire has occurred and shall be centralized on the wheelhouse and such other positions as will ensure that any alarm from the system is immediately received by the crew. Additionally, arrangements shall be provided to ensure that an alarm is sounded on the deck on which the fire has been detected. Such an alarm and detection system shall be so constructed as to indicate if any fault occurs in the system.

4 Detectors shall be grouped into separate sections, each covering not more than 50 rooms served by such a system and containing not more than 100 detectors. Detectors shall be zoned to indicate on which deck a fire has occurred.

5 The system shall be operated by an abnormal air temperature, by an abnormal concentration of smoke or by other factors indicative of incipient fire in any one of the spaces to be protected. Systems, which are sensitive to air temperature, shall not operate at less than 54ºC and shall operate at a temperature not greater than 78ºC when the temperature increase to those levels is not more than 1ºC per minute. At the discretion of the Administration, the permissible temperature of operation can be increased to 30ºC above the maximum deckhead temperature in drying rooms and similar places of a normally high ambient temperature. Systems, which are sensitive to smoke concentration, shall operate on the reduction of the intensity of a transmitted light beam by an amount to be determined by the Administration. Other equally effective methods of operation can be accepted at the discretion of the Administration. The detection system shall not be used for any purpose other than fire detection.

6 The detectors shall be arranged to operate the alarm by the opening or closing of contacts or by other appropriate methods. They shall be fitted in an overhead position and shall be suitably protected against impact and physical damage. They shall be suitable for use in a marine atmosphere. They shall be placed in an open position clear of beams and other objects likely to obstruct the flow of hot gases or smoke to the sensitive element. Detectors operated by the closing of contacts shall be of the sealed contact type and the circuit shall be continuously monitored to indicate fault conditions.

7 At least one detector shall be installed in each space where detection facilities are required and there shall be not less than one detector for each 37 m^2 of deck area approximately. In large spaces, the detectors shall be arranged in a regular pattern so that no detector is more than 9 m from another detector or more than 4.5 m from a bulkhead.

8 There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire alarm and fire detection system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to a changeover switch situated in the control station for the fire detection system. The wiring system shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces having a high fire risk except, in so far as it is necessary, to provide for fire detection in such spaces or to reach the appropriate switchboard.

9 A list or plan shall be displayed adjacent to each indicating unit showing the spaces covered and the location of the zone in respect of each system. Suitable instructions for testing and maintenance shall be available.

10 Provision shall be made for testing the correct operation of the detectors and the indicating units by supplying means for applying hot air or smoke at detector positions.

11 Spare detector heads shall be provided for each section of detectors to the satisfaction of the Administration.

17 Fixed fire-extinguishing arrangements in cargo spaces of high fire risk

Cargo spaces of high fire risk shall be protected by a fixed gas fire-extinguishing system complying with the Fire Safety System Code or by a fire-extinguishing system, which gives equivalent protection, to the satisfaction of the Administration.

18 Fire pumps

1 At least two fire pumps shall be provided.

2 If a fire in any one compartment could put all the fire pumps out of action, there shall be an alternative means of providing water for fire fighting. In vessels of 75 m in length and over, this alternative means shall be a fixed emergency fire pump independently driven. This emergency fire pump shall be capable of supplying two jets of water to the satisfaction of the Administration.

3 The fire pumps, other than the emergency pump shall be capable of delivering for fire-fighting purposes a quantity of water at a minimum pressure of 0.25 N/mm^2, with a total capacity (Q) of at least:

$$Q = \left(0.15 \sqrt{L(B+D)} + 2.25 \right)^2 \ m^3/h$$

where L, B and D are in metres.

However, the total required capacity of the fire pumps need not exceed l80 m3/h.

4 Each of the required fire pumps other than any emergency pump shall have a capacity not less than 40% of the total capacity of fire pumps required by 3 and shall, in any event, be capable of delivering at least the jets of water required by 3. These fire pumps shall be capable of supplying the fire main systems under the required conditions. Where more than two pumps are installed, the capacity of such additional pumps shall be to the satisfaction of the Administration.

5 Fire pumps shall be independently driven power pumps. Sanitary, ballast, bilge or general service pumps can be accepted as fire pumps, provided that they are not normally used for pumping oil and that, if they are subject to occasional duty for the transfer or pumping of fuel oil, suitable change-over arrangements are fitted.

6 Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any of the fire main systems.

7 Emergency power-operated fire pumps shall be independently driven self-contained pumps either with their own diesel engine prime mover and fuel supply fitted in an accessible position outside the compartment which contains the main fire pumps, or be driven by a self-contained generator, which can be the emergency generator referred to in paragraph 16 of chapter 4, of sufficient capacity and which is positioned in a safe place outside the engine-room and preferably above the working deck. The emergency fire pump shall be capable of operating for a period of at least 3 h.

8 Emergency fire pumps, sea-suction valves and other necessary valves shall be operable from outside compartments containing main fire pumps in a position not likely to be cut off by a fire in those compartments.

19 Fire mains

1 Where more than one hydrant is required to provide the number of jets specified in paragraph 20.3, a fire main shall be provided.

2 Fire mains shall have no connections other than those required for fire fighting, except for the purpose of washing the deck and anchor chains and operation of bilge ejectors, subject to the efficiency of the fire-fighting system being maintained.

3 Where fire mains are not self-draining, suitable drain cocks shall be fitted where frost damage could be expected.

4 The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously or of 140 m3 per hour, whichever is the less.

5 With the two pumps simultaneously delivering through nozzles specified in paragraph 20.7 the quantity of water specified in 4, through any adjacent hydrants, the minimum pressure of 0.25 N/mm^2 shall be maintained at all hydrants.

20 Fire hydrants, fire hoses and nozzles

1 The number of fire hoses provided shall be equal to the number of fire hydrants arranged according to 3 and one spare hose. This number does not include any fire hoses required in any engine or boiler room. The Administration can increase the number of fire hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the size of the vessel.

2 Fire hoses shall be of approved material and sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be 20 m. Every fire hose shall be provided with a nozzle and the necessary couplings. Fire hoses shall together with any necessary fittings and tools be kept ready for use in conspicuous positions near the water service hydrants or connections.

3 The number and position of the hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of fire hose, may reach any part of the vessel normally accessible to the crew while the vessel is being navigated.

4 All required hydrants shall be fitted with fire hoses having dual-purpose nozzles as required by 7. One hydrant shall be located near the entrance of the space to be protected.

5 Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. In vessels where deck cargo can be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged, as far as practicable, to avoid risk of damage by such cargo. Unless one fire hose and nozzle is provided for each hydrant, there shall be complete interchange ability of fire hose couplings and nozzles.

6 A cock or valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are operating.

7 Standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near to as possible. Larger diameter nozzles can be permitted at the discretion of the Administration.

8 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

9 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure specified in paragraph 19.5 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

21 Fire extinguishers

1 Fire extinguishers shall be of approved types. The capacity of required portable fluid extinguishers shall be not more than 13.5 l and not less than 9 l. Other extinguishers shall not be in excess of the equivalent portability of the 13.5 l fluid extinguisher and shall not be less than the fire-extinguishing equivalent of a 9 l fluid extinguisher. The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided to the satisfaction of the Administration.

3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use, gives off toxic gases in such quantities as to endanger persons, shall not be permitted.

4 Fire extinguishers shall be periodically examined and subject to such tests as the Administration may require.

5 Normally, one of the portable fire extinguishers intended for use in any space shall be stowed near an entrance to that space.

22 Portable fire extinguishers in control stations and accommodation and service spaces

1 At least five approved portable fire extinguishers shall be provided in control stations and accommodation and service spaces to the satisfaction of the Administration.

2 Spare charges shall be provided to the satisfaction of the Administration.

23 Fire-extinguishing appliances in machinery spaces

1 Spaces containing oil-fired boilers or fuel oil units shall be provided with one of the following fixed fire-extinguishing systems, to the satisfaction of the Administration:

.1 a pressure water-spraying installation;

.2 a fire-smothering gas installation;

.3 a fire-extinguishing installation using vapours from low toxicity vaporizing liquids; or

.4 a fire-extinguishing installation using high expansion foam.

Where the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment.

2 New installations of halogenated hydrocarbon systems used as fire-extinguishing media shall be prohibited on new and existing vessels.

3 Every boiler room shall be provided with at least one set of portable air-foam equipment to the satisfaction of the Administration.

4 At least two approved portable extinguishers discharging foam or equivalent shall be provided in each firing space in each boiler room and each space in which a part of the fuel oil installation is situated. At least one approved foam-type extinguisher of at least 135 l capacity or equivalent shall be provided in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. The Administration can relax the requirements of this paragraph, having regard to the size and nature of the space to be protected.

5 In each firing space, there shall be a receptacle containing sand, sawdust impregnated with soda or other approved dry material, in such quantity as may be required by the Administration. Alternatively, an approved portable extinguisher may be provided.

6 Spaces containing internal combustion machinery used either for main propulsion or for other purposes, when such machinery has a total power output of not less than 750 kW, shall be provided with the following arrangements:

.1 one of the fire-extinguishing systems required by 1;

.2 at least one set of portable air-foam equipment to the satisfaction of the Administration; and

.3 in each such space, approved foam-type fire extinguishers each of at least 45 l capacity, or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable foam extinguishers or equivalent, which shall be so located that an extinguisher is not more than 10 m walking distance from any point in the space, provided that there shall be at least two such extinguishers in each such space. For smaller spaces the Administration can relax these requirements.

7 Spaces containing steam turbines or enclosed steam engines used either for main propulsion, or for other purposes, when such machinery has a total power output of not less than 750 kW shall be provided with the following arrangements:

.1 foam fire extinguishers each of at least 45 l capacity, or equivalent, sufficient in number to enable foam or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. Such extinguishers need not be required if such spaces are protected by a fixed fire-extinguishing system fitted in compliance with 1; and

.2 a sufficient number of portable foam extinguishers, or equivalent, which shall be so located that an extinguisher is not more than 10 m walking distance from any point in the space; provided that there shall be at least two such extinguishers in each such space, and such extinguishers shall not be required in addition to any provided in compliance with 6.3.

8 Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in 1, 6 and 7, there shall be provided in, or adjacent to, that space a number of approved portable fire extinguishers or other means of fire extinction to the satisfaction of the Administration.

9 Where fixed fire-extinguishing systems not required by this part are installed, such systems shall be to the satisfaction of the Administration.

10 For any machinery space of category A to which access is provided at a low level from an adjacent shaft tunnel, there shall be provided, in addition to any watertight door and on the side remote from that machinery space, a light steel fire-screen door which shall be capable of being operated from each side of the door.

24 International shore connection

1 At least one international shore connection complying with 2 shall be provided.

5.23.2 Standard dimensions of flanges for the international shore connection shall be in accordance with the following table:

Description	Dimension
Outside diameter	178 mm
Inner diameter	64 mm
Bolt circle diameter	132 mm
Slots in flange	4 holes 19 mm in diameter equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery
Flange thickness	14.5 mm minimum
Bolts and nuts	4 each of 16 mm in diameter and 50 mm in length

3 This connection shall be constructed of material suitable for 1 N/mm^2 service pressure.

4 The flange shall have a flat face on one side and the other shall have a coupling permanently attached thereto that will fit the vessel's hydrant and hose. The connection shall be kept aboard the vessel together with a gasket of any material suitable for 1 N/mm^2 service pressure together with four 16 mm bolts 50 mm in length and eight washers.

5 Facilities shall be available enabling such a connection to be used on either side of the vessel.

25 Fire-fighters' outfits

1 At least two fire-fighters' outfits shall be carried. The fire-fighters' outfits shall be in accordance with paragraphs 2.1, 2.1.1 and 2.1.2 of chapter 3 of the Fire Safety Systems Code.

2 The fire-fighters' outfits shall be stored so as to be easily accessible and ready for use and shall be stored in widely separated positions.

26 Fire control plan

There shall be a permanently exhibited fire control plan to the satisfaction of the Administration.

27 Ready availability of fire-extinguishing appliances

Fire-extinguishing appliances shall be kept in good order and available for immediate use at all times.

28 Acceptance of substitutes

Where in this part any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc., can be allowed, provided the Administration is satisfied that it is not less effective.

PART C - FIRE SAFETY MEASURES IN VESSELS OF 45 M IN LENGTH AND OVER BUT LESS THAN 60 M

29 Structural fire protection

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of non-combustible materials. The Administration may permit combustible construction provided the requirements of this section and the additional fire-extinguishing requirements of paragraph 41.5 are complied with.

2 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads separating machinery spaces of category A from accommodation spaces, service spaces or control stations shall be constructed to "A-60" class standard where the machinery space of category A is not provided with a fixed fire-extinguishing system and to "A-30" class standard where such a system is fitted. Decks and bulkheads separating other machinery spaces from accommodation, service spaces and control stations shall be constructed to "A-0" class standard. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "A" class standard, insulated to the satisfaction of the Administration, except that the Administration may permit the fitting of "B-15" class divisions for separating such spaces as skipper's cabin from the wheelhouse.

3 In vessels, the hull of which is constructed of combustible materials, the decks and bulkheads separating machinery spaces from accommodation spaces, service spaces or control stations shall be constructed to "F" class or "B-15" class standard. In addition, machinery space boundaries shall as far as practicable prevent the passage of smoke. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "F" class standard.

4 In vessels, the hull of which is constructed of non-combustible materials, bulkheads of corridors serving accommodation spaces, service spaces and control stations shall be of "B-15" class divisions.

5 In vessels, the hull of which is constructed of combustible materials, bulkheads of corridors serving accommodation spaces, service spaces and control stations, shall be of "F" class divisions.

6 Any bulkhead required by 4 or 5 shall extend from deck to deck unless a continuous ceiling of the same class as the bulkhead is fitted on both sides of the bulkhead, in which case the bulkhead can terminate at the continuous ceiling.

7 Interior stairways serving accommodation spaces, service spaces or control stations shall be of steel or other equivalent material. Such stairways shall be within enclosures constructed of "F" class divisions in vessels the hull of which is constructed of combustible materials, or "B-15" class divisions in vessels the hull of which is constructed of non-combustible materials, provided that where a stairway penetrates only one deck it need be enclosed at one level only.

8 Doors and other closures of openings in bulkheads and decks referred to in 2 and in paragraph 28.7, doors fitted to stairway enclosures referred to in paragraph 28.7 and doors fitted in engine and boiler casings, shall be as far as practicable equivalent in resisting fire to the divisions in which they are fitted. Doors to machinery spaces of category A shall be self-closing.

9 Lift trunks, which pass through the accommodation and service spaces, shall be constructed of steel or equivalent material and shall be provided with means of closing which will permit control of draught and smoke.

10 In vessels, the hull of which is constructed of combustible materials, the boundary bulkheads and decks of spaces containing any emergency source of power and bulkheads and decks between galleys, paint rooms, lamp rooms or any store-rooms which contain appreciable quantities of highly flammable materials, and accommodation spaces, service spaces or control stations shall be constructed of "F" class or "B-15" class divisions.

11 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads referred to in 5.28.10 shall be of "A" class divisions insulated to the satisfaction of the Administration, having in mind the risk of fire, except that the Administration can accept "B-15" class divisions between galley and accommodation spaces, service spaces and control stations when the galley contains electrically heated furnaces, electrically heated hot water appliances or other electrically heated appliances only.

12 Highly flammable products shall be carried in suitably sealed containers.

13 Where bulkheads or decks required by 2, 4, 8 or 10 to be of "A", "B" or "F" class divisions, are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., arrangements shall be made to ensure that the fire integrity of the division is not impaired.

14 Air spaces enclosed behind ceilings, panellings or linings in accommodation spaces, service spaces and control stations shall be divided by close-fitting draught stops spaced not more than 7 m apart.

15 Windows and skylights to machinery spaces shall be as follows:

.1 where skylights can be opened, they shall be capable of being closed from outside the space. Skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material which is permanently attached;

.2 glass or similar materials shall not be fitted in machinery space boundaries.

This does not preclude the use of wire-reinforced glass for skylights and glass in control rooms within the machinery spaces; and

.3 in skylights referred to in 15.1 wire-reinforced glass shall be used.

16 Insulating materials in accommodation spaces, service spaces except domestic refrigerating compartments, control stations and machinery space shall be non- combustible. The surface of insulation fitted on the internal boundaries of machinery spaces of category A shall be impervious to oil or oil vapours.

17 Within compartments used for stowage of fish, combustible insulation shall be protected by close-fitting cladding.

18 Notwithstanding the requirements of this section, the Administration can accept "A-0" class divisions in lieu of "B-15" or "F" class divisions, having regard to the amount of combustible materials used in adjacent spaces.

30 Ventilation systems

1 Except as provided for in 2, means shall be provided to stop fans and close main openings to ventilation systems from outside the spaces served.

2 Means shall be provided for closing, from a safe position, the annular spaces around funnels.

3 Ventilation openings can be permitted in and under the doors in corridor bulkheads except that such openings shall not be permitted in and under stairway enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m^2. When such opening is cut in a door, it shall be fitted with a grille made of non-combustible material.

4 Ventilation ducts for machinery spaces of category A or galleys shall not, in general, pass through accommodation spaces, service spaces or control stations. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions.

5 Ventilation ducts of accommodation spaces, service spaces or control stations shall not, in general, pass through machinery spaces of category A or through galleys. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions.

6 Store-rooms containing appreciable quantities of highly flammable products shall be provided with ventilation arrangements, which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators shall be positioned in safe areas. Suitable wire mesh guards to arrest sparks shall be fitted over inlet and outlet ventilation openings.

7 Ventilation systems serving machinery spaces shall be independent of systems serving other spaces.

8 Where trunks or ducts serve spaces on both sides of "A" class bulkheads or decks, dampers shall be fitted so as to prevent the spread of fire and smoke between compartments.

Manual dampers shall be operable from both sides of the bulkhead or the deck. Where the trunks or ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "A" class bulkheads or decks, automatic self-closing dampers shall be fitted. Trunks serving compartments situated only on one side of such bulkheads shall comply with paragraph 9.1.2.

31 Heating installations

1 Electric radiators shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator shall be fitted with an element so exposed that clothing, curtains or other similar materials can be scorched or set on fire by heat from the element.

2 Heating by means of open fires shall not be permitted. Heating stoves and other similar appliances shall be firmly secured and adequate protection and insulation against fire shall be provided beneath and around such appliances and in way of their uptakes. Uptakes of stoves, which burn solid fuel, shall be so arranged and designed as to minimize the possibility of becoming blocked by combustion products and shall have a ready means for cleaning. Dampers for limiting draughts in uptakes shall, when in the closed position, still leave an adequate area open. Spaces in which stoves are installed shall be provided with ventilators of sufficient area to provide adequate combustion-air for the stove. Such ventilators shall have no means of closure and their position shall be such that no closing appliances in accordance with paragraph 9 of chapter 2 are required.

3 Open flame gas appliances, except cooking stoves and water heaters, shall not be permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe place. All pipes conveying gas from container to stove or water heater shall be of steel or other approved material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance.

32 Miscellaneous items

1 Exposed surfaces within accommodation spaces, service spaces, control stations, corridor and stairway enclosures and the concealed surfaces behind bulkheads, ceilings, panellings and linings in accommodation spaces, service spaces, and control stations shall have low flame-spread characteristics.

2 All exposed surfaces of glass reinforced plastic construction within accommodation and service spaces, control stations, machinery spaces of category A and other machinery spaces of similar fire risk shall have the final lay-up layer of approved resin having inherent fire-retardant properties or be coated with an approved fire-retardant paint or be protected by non-combustible materials.

3 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours. The Administration shall be satisfied that they are not of a nature to offer undue fire hazard.

4 Primary deck coverings within accommodation and service spaces and control stations shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures.

5 In accommodation and service spaces and control stations, pipes penetrating “A” or “B” class divisions shall be of approved materials having regard to the temperature that such divisions are required to withstand. Where the Administration permits the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of an approved material having regard to the fire risk.

6 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

7 All waste receptacles other than those used in fish processing shall be constructed of non-combustible materials with no openings in the sides and bottom.

8 Machinery driving fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they can be stopped in the event of a fire arising in the space in which they are located.

9 Drip trays shall be fitted, where necessary, to prevent oil leaking into bilges.

33 Storage of gas cylinders and dangerous materials

1 Cylinders for compressed, liquefied or dissolved gases shall be clearly marked by means of prescribed identifying colours, have a clearly legible identification of the name and chemical formula of their contents and shall be properly secured.

2 Cylinders containing flammable or other dangerous gases and expended cylinders shall be stored, properly secured, on open decks; and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Cylinders shall be protected against excessive variations in temperature, direct rays of the sun and accumulation of snow. However, the Administration can permit such cylinders to be stored in compartments complying with the requirements of 3 to 5.

3 Spaces containing highly flammable liquids, such as volatile paints, paraffin, benzole, etc. and, where permitted, liquefied gas shall have direct access from open decks only. Pressure-adjusting devices and relief valves shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they shall be gastight.

4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be to the satisfaction of the Administration for use in a flammable atmosphere. Sources of heat shall be kept clear of such spaces and “No Smoking” and “No Naked Light” notices shall be displayed in a prominent position.

5 Separate storage shall be provided for each type of compressed gas. Compartments used for the storage of such gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system. However, the Administration may relax these requirements considering the characteristics, volume and intended use of such compressed gases.

34 Means of escape

1 Stairways and ladders leading to and from all accommodation spaces and in spaces, in which the crew is normally employed, other than machinery spaces, shall be so arranged as to provide ready means of escape to the open deck and thence to the survival craft. In particular, in relation to these spaces:

.1 at all levels of accommodation, at least two widely separated means of escape shall be provided which can include the normal means of access from each restricted space or group of spaces;

2.1 below the weather deck, the means of escape shall be a stairway and the second escape can be a trunk or a stairway; and

2.2 above the weather deck, the means of escape shall be stairways or doors to an open deck or a combination thereof. Where it is not practicable to fit stairways or doors, one of these means of escape can be by means of adequately sized portholes or hatches protected, where necessary, against ice accretion;

.3 exceptionally, the Administration can permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be accommodated or employed there;

.4 a corridor or part of a corridor from which there is only one route of escape shall preferably not exceed 2.5 m in length and, in no case, be greater than 5 m in length; and

.5 the width and continuity of the means of escape shall be to the satisfaction of the Administration.

2 Two means of escape shall be provided from every machinery space of category A, which shall be as widely separated as possible. Vertical escapes shall be by means of steel ladders. Where the size of the machinery spaces makes it impracticable, one of these means of escape can be omitted. In such cases, special consideration shall be given to the remaining exit.

3 Lifts shall not be considered as forming one of the required means of escape.

35 Automatic fire alarm and fire detection systems

Where the Administration has permitted under paragraph 29.1 a combustible construction, or where otherwise appreciable amounts of combustible materials are used in the construction of accommodation spaces, service spaces and control stations, special consideration shall be given to the installation of an automatic fire alarm and fire detection system in those spaces, having due regard to the size of those spaces, their arrangement and location relative to control stations as well as, where applicable, the flame-spread characteristics of the installed furniture.

36 Fire pumps

1 The minimum number and type of fire pumps to be fitted shall be as follows:

.1 one power pump not dependent upon the main machinery for its motive power; or

.2 one power pump driven by main machinery provided that the propeller shafting can be readily disconnected or provided that a controllable pitch propeller is fitted.

2 Sanitary, bilge, ballast, general service or any other pumps can be used as fire pumps if they comply with the requirements of this chapter and do not affect the ability to cope with pumping of the bilges. Fire pumps shall be so connected that they cannot be used for pumping oil or other flammable liquids.

3 Centrifugal pumps or other pumps connected to the fire main through which back flow could occur shall be fitted with non-return valves.

4 Vessels not fitted with a power-operated emergency fire pump and without a fixed fire-extinguishing system in the machinery spaces shall be provided with additional fire-extinguishing means to the satisfaction of the Administration.

5 When fitted, emergency power-operated fire pumps shall be independently driven self-contained pumps either with their own prime mover and fuel supply fitted in an accessible position outside the compartment which contains the main fire pumps, or be driven by a self-contained generator which can be an emergency generator of sufficient capacity and which is positioned in a safe place outside the engine-room and preferably above the working deck.

6 For any emergency fire pump, where fitted, the pump, sea-suction valves and other necessary valves shall be operable from outside compartments containing main fire pumps in a position not likely to be cut off by a fire in those compartments.

7 The total capacity (Q) of main power-operated fire pumps shall be at least:

$$Q = \left(0.15\sqrt{L(B+D)} + 2.25\right)^2 \ m^3/h$$

where L, B and D are in metres.

8 Where two independent power-operated fire pumps are fitted, the capacity of each pump shall not be less than 40% of the quantity required by 7.

9 When main power fire pumps are delivering the quantity of water required by 7 through the fire main, fire hoses and nozzles, the pressure maintained at any hydrant shall be not less than 0.25 N/mm^2.

10 Where power-operated emergency fire pumps are delivering the maximum quantity of water through the jet required by paragraph 38.1, the pressure maintained at any hydrant shall be to the satisfaction of the Administration.

37 Fire mains

1 Where more than one hydrant is required to provide the number of jets required by paragraph 38.1, a fire main shall be provided.

2 Materials readily rendered ineffective by heat shall not be used for fire mains, unless adequately protected.

3 Where fire pump delivery pressure can exceed the designed working pressure of fire mains, relief valves shall be fitted.

4 Fire mains shall have no connections other than those required for fire fighting, except for the purpose of washing the deck and anchor chains or operation of bilge ejectors, subject to the efficiency of the fire-fighting system being maintained.

5 Where fire mains are not self-draining, suitable drain cocks shall be fitted where frost damage may be expected.

38 Fire hydrants, fire hoses and nozzles

1 Fire hydrants shall be positioned so as to allow easy and quick connection of fire hoses and so that at least one jet can be directed into any part of the vessel which is normally accessible during navigation.

2 The jet required in 1 shall be from a single length of fire hose.

3 In addition to the requirements of 1, machinery spaces of category A shall be provided with at least one fire hydrant complete with fire hose and dual-purpose nozzle. This fire hydrant shall be located outside the space and near the entrance.

4 For every required fire hydrant, there shall be one fire hose. At least one spare fire hose shall be provided in addition to this requirement.

5 Single lengths of fire hose shall not exceed 20 m.

6 Fire hoses shall be of an approved material. Each fire hose shall be provided with couplings and a dual-purpose nozzle.

7 Except where fire hoses are permanently attached to the fire main, the couplings of fire hoses and nozzles shall be completely interchangeable.

8 The nozzles as required by 6 shall be appropriate to the delivery capacity of the fire pumps fitted, but in any case shall have a diameter of not less than 12 mm.

39 Fire extinguishers

1 Fire extinguishers shall be of approved types. The capacity of required portable fluid extinguishers shall be not more than 13.5 l and not less than 9 l. Other extinguishers shall not be in excess of the equivalent portability of the 13.5 l fluid extinguisher and shall not be less than the fire-extinguishing equivalent of a 9 l fluid extinguisher. The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided to the satisfaction of the Administration.

3 Fire extinguishers containing an extinguishing medium, which, in the opinion of the Administration, either by itself or under expected conditions of use, gives off toxic gases in such quantities as to endanger persons shall not be permitted.

4 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

5 Normally, one of the portable fire extinguishers intended for use in any space shall be stowed near an entrance to that space.

40 Portable fire extinguishers in control stations and accommodation and service spaces

1 A sufficient number of approved portable fire extinguishers shall be provided in control stations and accommodation and service spaces to ensure that at least one extinguisher of a suitable type is readily available for use in any part of such spaces. The total number of extinguishers in these spaces, however, shall not be less than three.

2 Spare charges shall be provided to the satisfaction of the Administration.

41 Fire-extinguishing appliances in machinery spaces

1 Spaces containing oil-fired boilers, fuel oil units or internal combustion machinery having a total power output of not less than 750 kW shall be provided with one of the following fixed fire extinguishing systems, to the satisfaction of the Administration:

.1 a pressure water-spraying installation;

.2 a fire-smothering gas installation;

.3 a fire-extinguishing installation using vapours from low toxicity vaporizing liquids; or

.4 a fire-extinguishing installation using high expansion foam.

2 New installations of halogenated hydrocarbon systems used as fire-extinguishing media shall be prohibited on new and existing vessels.

3 Where the engine and boiler rooms are not entirely separated from each other or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment.

4 Installations listed in 1 shall be controlled from readily accessible positions outside such spaces not likely to be cut off by a fire in the protected space. Arrangements shall be made to ensure the supply of power and water necessary for the operation of the system in the event of fire in the protected space.

5 Vessels which are constructed mainly or wholly of wood or fibre reinforced plastic and fitted with oil-fired boilers or internal combustion machinery which are decked in way of the machinery space with such material, shall be provided with one of the extinguishing systems referred to in 1.

6 In all machinery spaces of category A at least two portable extinguishers shall be provided, of a type suitable for extinguishing fires involving fuel oil. Where such spaces contain machinery, which has a total power output of not less than 250 kW, at least three such extinguishers shall be provided. One of the extinguishers shall be stowed near the entrance to the space.

7 Vessels having machinery spaces not protected by a fixed fire extinguishing system shall be provided with at least a 45 l foam extinguisher or its equivalent, suitable for fighting oil fires. Where the size of the machinery spaces makes this provision impracticable, the Administration can accept an additional number of portable fire extinguishers.

42 Fire-fighters' outfits

The number of fire-fighters' outfits and their locations shall be to the satisfaction of the Administration.

43 Fire control plan

There shall be a permanently exhibited fire control plan to the satisfaction of the Administration.

44 Ready availability of fire-extinguishing appliances

Fire-extinguishing appliances shall be kept in good order and available for immediate use at all times.

45 Acceptance of substitutes

Where in this part any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc. can be allowed provided the Administration is satisfied that it is not less effective.

RT D - FIRE SAFETY MEASURES IN VESSELS OF 24 M IN LENGTH AND OVER BUT LESS THAN 45 M

46 Structural fire protection

1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of non-combustible materials. The Administration may permit combustible construction provided the requirements of this section and the additional fire-extinguishing requirements of paragraph 41.5 are complied with.

2 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads separating machinery spaces of category A from accommodation spaces, service spaces or control stations shall be constructed to "A-60" class standard where the machinery space of category A is not provided with a fixed fire-extinguishing system and to "A-0" class standard where such a system is fitted. Decks and bulkheads separating other machinery spaces from accommodation, service spaces and control stations shall be constructed to "A-0" class standard. Decks and bulkheads separating control stations from accommodation and service spaces shall be constructed to "B" class standard, insulated to the satisfaction of the Administration.

3 In vessels, the hull of which is constructed of combustible materials, the decks and bulkheads separating machinery spaces from accommodation spaces, service spaces or control stations shall be constructed to "F" class or "B-15" class standard. In addition, machinery space boundaries shall, as far as practicable, prevent the passage of smoke. Decks and bulkheads

separating control stations from accommodation and service spaces shall be constructed to “F” class standard.

4 In vessels, the hull of which is constructed of non-combustible materials, such bulkheads shall be of “B-0” class divisions.

5 In vessels, the hull of which is constructed of combustible materials, such bulkheads shall be of fire-retardant material to the satisfaction of the Administration.

6 Any bulkhead of corridors serving accommodation spaces, services and central stations shall extend from deck to deck unless a continuous ceiling of the same class as the bulkhead is fitted on both sides of the bulkhead, in which case the bulkhead can terminate at the continuous ceiling.

7 Interior stairways serving accommodation spaces, service spaces or control stations shall be of steel or other equivalent material. Such stairways connecting more than two decks shall be within enclosures constructed of “F” class divisions in vessels, the hull of which is constructed of combustible materials, or “B-15” class divisions in vessels, the hull of which is constructed of non-combustible materials.

8 Doors and other closures of openings in bulkheads and decks referred to in 2 and 4, doors fitted to stairway enclosures referred to in 7 and doors fitted in engine and boiler casings, shall be, as far as practicable, equivalent in resisting fire to the divisions in which they are fitted. Doors to machinery spaces of category A shall be self-closing.

9 Lift trunks which pass through the accommodation and service spaces shall be constructed of steel or equivalent material and shall be provided with means of closing which will permit control of draught and smoke.

10 In vessels, the hull of which is constructed of combustible materials, the boundary bulkheads and decks of spaces containing any emergency source of power and bulkheads and decks between galleys, paint rooms, lamp rooms or any store-rooms which contain appreciable quantities of highly flammable materials, and accommodation spaces, service spaces or control stations shall be constructed of “F” class or “B-15” class divisions.

11 In vessels, the hull of which is constructed of non-combustible materials, the decks and bulkheads referred to in 10 shall be of “A” class divisions insulated to the satisfaction of the Administration, having in mind the risk of fire, except that the Administration can accept “B-15” class divisions between galley and accommodation spaces, service spaces and control stations when the galley contains electrically heated furnaces, electrically heated hot water appliances or other electrically heated appliances only.

12 Highly flammable products shall be carried in suitably sealed containers.

13 Where bulkheads or decks required by 2, 4, 8 or 10 to be of “A”, “B” or “F” class divisions, are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., arrangements shall be made to ensure that the fire integrity of the division is not impaired.

14 Air spaces enclosed behind ceilings, panellings or linings in accommodation spaces, service spaces and control stations shall be divided by close-fitting draught stops spaced not more than 7 m apart.

15 Windows and skylights to machinery spaces shall be as follows:

.1 where skylights can be opened, they shall be capable of being closed from outside the space. Skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material which is permanently attached;

.2 glass or similar materials shall not be fitted in machinery space boundaries.

This does not preclude the use of wire-reinforced glass for skylights and glass in control rooms within the machinery spaces; and

.3 in skylights referred to in 15.1, wire-reinforced glass shall be used.

16 Insulating materials in accommodation spaces, service spaces except domestic refrigerating compartments, control stations and machinery space shall be non- combustible. The surface of insulation fitted on the internal boundaries of machinery spaces of category A shall be impervious to oil or oil vapours.

17 Within compartments used for stowage of fish, combustible insulation shall be protected by close-fitting cladding.

5.45.18 Notwithstanding the requirements of this section, the Administration can accept "A-0" class divisions in lieu of "B-15" or "F" class divisions, having regard to the amount of combustible materials used in adjacent spaces.

47 Ventilation systems

1 Except as provided for in 2, means shall be provided to stop fans and close main openings to ventilation systems from outside the spaces served.

2 Means shall be provided for closing, from a safe position, the annular spaces around funnels.

3 Ventilation openings can be permitted in and under the doors in corridor bulkheads except that such openings shall not be permitted in and under stairway enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0.05 m^2. When such opening is cut in a door, it shall be fitted with a grille made of non-combustible material.

4 Ventilation ducts for machinery spaces of category A or galleys shall not, in general, pass through accommodation spaces, service spaces or control stations. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions.

5 Ventilation ducts of accommodation spaces, service spaces or control stations shall not, in general, pass through machinery spaces of category A or through galleys. Where the Administration permits this arrangement, the ducts shall be constructed of steel or equivalent material and arranged to preserve the integrity of the divisions.

6 Store-rooms containing appreciable quantities of highly flammable products shall be provided with ventilation arrangements, which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators

shall be positioned in safe areas. Suitable wire mesh guards to arrest sparks shall be fitted over inlet and outlet ventilation openings.

7 Ventilation systems serving machinery spaces shall be independent of systems serving other spaces.

8 Where trunks or ducts serve spaces on both sides of "A" class bulkheads or decks, dampers shall be fitted so as to prevent the spread of fire and smoke between compartments. Manual dampers shall be operable from both sides of the bulkhead or the deck. Where the trunks or ducts with a free cross-sectional area exceeding 0.02 m^2 pass through "A" class bulkheads or decks, automatic self-closing dampers shall be fitted.

Trunks serving compartments situated only on one side of such bulkheads shall comply with paragraph 10.2.

48 Heating installations

1 Electric radiators shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiator shall be fitted with an element so exposed that clothing, curtains or other similar materials can be scorched or set on fire by heat from the element.

2 Heating by means of open fires is not permitted. Heating stoves and other similar appliances shall be firmly secured and adequate protection and insulation against fire shall be provided beneath and around such appliances and in way of their uptakes. Uptakes of stoves, which burn solid fuel, shall be so arranged and designed as to minimize the possibility of becoming blocked by combustion products and shall have a ready means for cleaning. Dampers for limiting draughts in uptakes shall, when in the closed position, still leave an adequate area open. Spaces in which stoves are installed shall be provided with ventilators of sufficient area to provide adequate combustion-air for the stove. Such ventilators shall have no means of closure and their position shall be such that no closing appliances in accordance with paragraph 9 of chapter 2 are required.

3 Open flame gas appliances, except cooking stoves and water heaters, are not permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe place. All pipes conveying gas from container to stove or water heater shall be of steel or other approved material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance.

49 Miscellaneous items

1 Exposed surfaces within accommodation spaces, service spaces, control stations, corridor and stairway enclosures and the concealed surfaces behind bulkheads, ceilings, panellings and linings in accommodation spaces, service spaces, and control stations shall have low flame-spread characteristics, or to be of fire-retardant materials to the satisfaction of the Administration.

2 All exposed surfaces of glass reinforced plastic construction within accommodation and service spaces, control stations, machinery spaces of category A and other machinery spaces of similar fire risk shall have the final lay-up layer of approved resin having inherent fire-

retardant properties or be coated with an approved fire-retardant paint or be protected by non-combustible materials.

3 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke or toxic gases or vapours. The Administration shall be satisfied that they are not of a nature to offer undue fire hazard.

4 Primary deck coverings within accommodation and service spaces and control stations shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures.

5 In accommodation and service spaces and control stations, pipes penetrating "A" or "B" class divisions shall be of approved materials having regard to the temperature that such divisions are required to withstand. Where the Administration permits the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of an approved material having regard to the fire risk.

6 Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

7 All waste receptacles other than those used in fish processing shall be constructed of non-combustible materials with no openings in the sides and bottom.

8 Machinery driving fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they can be stopped in the event of a fire arising in the space in which they are located.

9 Drip trays shall be fitted, where necessary, to prevent oil leaking into bilges.

50 Storage of gas cylinders and dangerous materials

1 Cylinders for compressed, liquefied or dissolved gases shall be clearly marked by means of prescribed identifying colours, have a clearly legible identification of the name and chemical formula of their contents and shall be properly secured.

2 Cylinders containing flammable or other dangerous gases and expended cylinders shall be stored, properly secured, on open decks; and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Cylinders shall be protected against excessive variations in temperature, direct rays of the sun, and accumulation of snow. However, the Administration can permit such cylinders to be stored in compartments complying with the requirements of 3 to 5.

3 Spaces containing highly flammable liquids, such as volatile paints, paraffin, benzole, etc. and, where permitted, liquefied gas shall have direct access from open decks only. Pressure-adjusting devices and relief valves shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces, they shall be gastight.

4 Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of highly flammable liquids or liquefied gases. Where such electrical fittings are installed, they shall be to the satisfaction of the

Administration for use in a flammable atmosphere. Sources of heat shall be kept clear of such spaces and “No Smoking” and “No Naked Light” notices shall be displayed in a prominent position.

5 Separate storage shall be provided for each type of compressed gas. Compartments used for the storage of such gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system. However, the Administration may relax these requirements considering the characteristics, volume and intended use of such compressed gases.

51 Means of escape

1 Stairways and ladders leading to and from all accommodation spaces and in spaces, in which the crew is normally employed, other than machinery spaces, shall be so arranged as to provide ready means of escape to the open deck and thence to the survival craft. In particular, in relation to these spaces:

.1 at all levels of accommodation, at least two widely separated means of escape shall be provided which can include the normal means of access from each restricted space or group of spaces;

.2.1 below the weather deck, the means of escape shall be a stairway and the second escape can be a trunk or a stairway; and

.2.2 above the weather deck, the means of escape shall be stairways or doors to an open deck or a combination thereof. Where it is not practicable to fit stairways or doors, one of these means of escape can be by means of adequately sized portholes or hatches protected, where necessary, against ice accretion;

.3 exceptionally, the Administration can permit only one means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be accommodated or employed there;

.4 a corridor or part of a corridor from which there is only one route of escape shall preferably not exceed 2.5 m in length and, in no case, be greater than 5 m in length; and

.5 the width and continuity of the means of escape shall be to the satisfaction of the Administration.

2 Two means of escape shall be provided from every machinery space of category A, which shall be as widely separated as possible. Vertical escapes shall be by means of steel ladders. Where the size of the machinery spaces makes it impracticable, one of these means of escape can be omitted. In such cases, special consideration shall be given to the remaining exit.

3 Lifts shall not be considered as forming one of the required means of escape.

52 Automatic fire alarm and fire detection systems

Where the Administration has permitted under paragraph 46.1 a combustible construction, or where otherwise appreciable amounts of combustible materials are used on the construction of accommodation spaces, service spaces and control stations, special consideration shall be given

to the installation of an automatic fire alarm and fire detection system in those spaces, having due regard to the size of those spaces, their arrangement and location relative to control stations as well as, where applicable, the flame-spread characteristics of the installed furniture.

53 Fire pumps

1 The minimum number and type of fire pumps to be fitted shall be as follows:

.1 one power pump not dependent upon the main machinery for its motive power; or

.2 one power pump driven by main machinery provided that the propeller shafting can be readily disconnected or provided that a controllable pitch propeller is fitted.

2 Sanitary, bilge, ballast, general service or any other pumps can be used as fire pumps if they comply with the requirements of this chapter and do not affect the ability to cope with pumping of the bilges. Fire pumps shall be so connected that they cannot be used for pumping oil or other flammable liquids.

3 Centrifugal pumps or other pumps connected to the fire main through which back flow could occur shall be fitted with non-return valves.

4 Vessels not fitted with a power-operated emergency fire pump and without a fixed fire-extinguishing system in the machinery spaces shall be provided with additional fire-extinguishing means to the satisfaction of the Administration.

5 When fitted, emergency power-operated fire pumps shall be independently driven self-contained pumps either with their own prime mover and fuel supply fitted in an accessible position outside the compartment which contains the main fire pumps, or be driven by a self-contained generator which can be an emergency generator of sufficient capacity and which is positioned in a safe place outside the engine-room and preferably above the working deck.

6 For any emergency fire pump, where fitted, the pump, sea-suction valves and other necessary valves shall be operable from outside compartments containing main fire pumps in a position not likely to be cut off by a fire in those compartments.

7 The total capacity (Q) of main power-operated fire pumps shall be at least:

$$Q = \left(0.15 \sqrt{L(B+D)} + 2.25 \right)^2 \ m^3/h$$

where L, B and D are in metres.

8 Where two independent power-operated fire pumps are fitted, the capacity of each pump shall not be less than 40 % of the quantity required by 7.

9 When main power fire pumps are delivering the quantity of water required by 7 through the fire main, fire hoses and nozzles, the pressure maintained at any hydrant shall be not less than 0.25 N/mm^2.

10 Where power-operated emergency fire pumps are delivering the maximum quantity of water through the jet required by paragraph 55.1, the pressure maintained at any hydrant shall be to the satisfaction of the Administration.

54 Fire mains

1 Where more than one hydrant is required to provide the number of jets required by paragraph 38.1, a fire main shall be provided.

2 Materials readily rendered ineffective by heat shall not be used for fire mains, unless adequately protected.

3 Where fire pump delivery pressure can exceed the designed working pressure of fire mains, relief valves shall be fitted.

4 Fire mains shall have no connections other than those required for fire fighting, except for the purpose of washing the deck and anchor chains or operation of bilge ejectors, subject to the efficiency of the fire-fighting system being maintained.

5 Where fire mains are not self-draining, suitable drain cocks shall be fitted where frost damage may be expected.

55 Fire hydrants, fire hoses and nozzles

1 Fire hydrants shall be positioned so as to allow easy and quick connection of fire hoses and so that at least one jet can be directed into any part of the vessel which is normally accessible during navigation.

2 The jet required in 1 shall be from a single length of fire hose.

3 In addition to the requirements of 1, machinery spaces of category A shall be provided with at least one fire hydrant complete with fire hose and dual-purpose nozzle. This fire hydrant shall be located outside the space and near the entrance.

4 For every required fire hydrant, there shall be one fire hose. At least one spare fire hose shall be provided in addition to this requirement.

5 Single lengths of fire hose shall not exceed 20 m.

6 Fire hoses shall be of an approved material. Each fire hose shall be provided with couplings and a dual-purpose nozzle.

7 Except where fire hoses are permanently attached to the fire main, the couplings of fire hoses and nozzles shall be completely interchangeable.

8 The nozzles as required by 6 shall be appropriate to the delivery capacity of the fire pumps fitted, but in any case shall have a diameter of not less than 12 mm.

56 Fire extinguishers

1 Fire extinguishers shall be of approved types. The capacity of required portable fluid extinguishers shall be not more than 13.5 l and not less than 9 l. Other extinguishers shall not be in excess of the equivalent portability of the 13.5 l fluid extinguisher and shall not be less

than the fire-extinguishing equivalent of a 9 l fluid extinguisher. The Administration shall determine the equivalents of fire extinguishers.

2 Spare charges shall be provided to the satisfaction of the Administration.

3 Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use, gives off toxic gases in such quantities as to endanger persons are not permitted.

4 Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

5 Normally, one of the portable fire extinguishers intended for use in any space shal be stowed near an entrance to that space.

57 Portable fire extinguishers in control stations and accommodation and service spaces

1 A sufficient number of approved portable fire extinguishers shall be provided in control stations and accommodation and service spaces to ensure that at least one extinguisher of a suitable type is readily available for use in any part of such spaces. The total number of extinguishers in these spaces, however, shall not be less than three.

2 Spare charges shall be provided to the satisfaction of the Administration.

58 Fire-extinguishing appliances in machinery spaces

1 Spaces containing oil-fired boilers, fuel oil units or internal combustion machinery having a total power output of not less than 750 kW shall be provided with one of the following fixed fire extinguishing systems, to the satisfaction of the Administration:

.1 a pressure water-spraying installation;

.2 a fire-smothering gas installation;

.3 a fire-extinguishing installation using vapours from low toxicity vaporizing liquids; or

.4 a fire-extinguishing installation using high expansion foam.

2 New installations of halogenated hydrocarbon systems used as fire-extinguishing media shall be prohibited on new and existing vessels.

3 Where the engine and boiler rooms are not entirely separated from each other or if fuel oil can drain from the boiler room into the engine-room, the combined engine and boiler rooms shall be considered as one compartment.

4 Installations listed in 1 shall be controlled from readily accessible positions outside such spaces not likely to be cut off by a fire in the protected space. Arrangements shall be made to ensure the supply of power and water necessary for the operation of the system in the event of fire in the protected space.

5 Vessels which are constructed mainly or wholly of wood or fibre reinforced plastic and fitted with oil-fired boilers or internal combustion machinery which are decked in way of the machinery space with such material, shall be provided with one of the extinguishing systems referred to in 1.

6 In all machinery spaces of category A at least two portable extinguishers shall be provided, of a type suitable for extinguishing fires involving fuel oil. Where such spaces contain machinery, which has a total power output of not less than 250 kW, at least three such extinguishers shall be provided. One of the extinguishers shall be stowed near the entrance to the space.

7 Vessels having machinery spaces not protected by a fixed fire extinguishing system shall be provided with at least a 45 l foam extinguisher or its equivalent, suitable for fighting oil fires. Where the size of the machinery spaces makes this provision impracticable, the Administration can accept an additional number of portable fire extinguishers.

59 Fire-fighters' outfits

The number of fire-fighters' outfits and their locations shall be to the satisfaction of the Administration.

60 Fire control plan

The Administration may dispense with this requirement.

61 Ready availability of fire-extinguishing appliances

Fire-extinguishing appliances shall be kept in good order and available for immediate use at all times.

62 Acceptance of substitutes

Where in this part any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc. can be allowed provided the Administration is satisfied that it is not less effective.

CHAPTER 6

PROTECTION OF THE CREW

1 Application to existing ships

The provisions of paragraphs 2, 3 (except paragraph 2), 4, 5.1, 7, 8.1, 11, 13, and 14 shall apply to existing ships.

2 General protective measures

1 An adequate number of lifelines, safety belts, bosun's chairs and stages shall be provided.

2 A lifeline system shall be designed to be effective for all needs and the necessary wires, ropes, shackles, eye bolts and cleats shall be provided.

3 Where there is a danger of personnel falling through deck openings, the coamings or sills shall have a suitable height; otherwise, such openings shall be provided with suitable guards, such as hinged or portable railings or netting. The Administration shall take into consideration the position and operational use of small openings such as fish and ice scuttles before deciding whether or not they should be provided with guards.

4 Where there is a danger of personnel falling through skylights, or other similar openings, such openings shall be fitted with protective bars not more than 350 mm apart.

5 The surface of decks throughout a vessel shall be specially designed or treated to minimize the possibility of personnel slipping. In particular, the decks and working spaces on board, such as machinery spaces, galleys and fish-handling and winch areas as well as deck areas at the foot and head of ladders and just outside the doors, shall be specially prepared or designed as anti-skid surfaces.

6 The Administration shall be satisfied that, consistent with safety and operational procedures, working arrangements on board provide for adequate rest periods for the crew.

3 Deck openings

1 Hinged covers of hatchways, manholes and other openings shall be protected against accidental closing. In particular, heavy covers on escape hatches shall be equipped with counterweights. The hatch shall be so constructed that it can be opened from each side of the cover.

2 Dimensions of access hatches shall not be less than 600 mm by 600 mm or 600 mm in diameter.

3 Where practical, handholds shall be provided above the level of the deck over escape openings.

4 External hatches and doors shall be closed when the vessel is at sea. All openings occasionally required to be kept open during fishing and which may lead to flooding shall be closed immediately if such danger of filling occurs with subsequent loss of buoyancy and stability.

4 Bulwarks, rails and guards

1 Efficient bulwarks or guardrails shall be fitted on all exposed parts of the working deck and on superstructure and deckhouse decks if they are working platforms. The height above deck of bulwarks or guardrails shall be at least 1 m, provided that, where this would interfere with the normal operation of the vessel, a lesser height may be approved by the Administration if adequate protection is provided.

2 The minimum vertical distance from the deepest operating waterline to the lowest point of the top of the bulwark, or to the edge of the working deck if guard rails are fitted shall ensure adequate protection for the crew from water shipped on deck, taking into account the sea states and the weather conditions in which the vessel may operate, the area of operation, type of vessel and its method of fishing.

3 Clearance below the lowest course of guardrails shall not exceed 230 mm. Other courses shall not be more than 380 mm apart, and the distance between stanchions shall not be more than 1.5 m. In a vessel with rounded gunwales, guardrail supports shall be placed on the flat of the deck. Rails shall be free from sharp points, edges and corners and shall be of adequate strength.

4 Satisfactory means in the form of guard rails, lifelines, gangways or underdeck passages, etc. shall be provided for the protection of the crew in getting to and from their quarters, machinery spaces and other working spaces. Storm rails shall be fitted on the outside of all deckhouses and casings.

5 A stern trawler shall be provided with doors, gates or other suitable protective arrangements at the top of the stern ramp at the same height as the adjacent bulwark or guard rails. When such protection is not in position, a chain or other means of protection shall be provided across the ramp.

6 Where a section of a bulwark or guard rail has to be removed or swung open to facilitate the fishing operation, as in the case of longline fishing, protection for the crew shall be provided at the opening. When it is not practical to reinstate the bulwark or guardrail between hauling operations, chains or other means of protection shall be provided across the opening. Where chains are to be fitted, the upper chain shall be level with the upper edge of the bulwark or guardrail and at least one other chain shall be fitted mid way between the upper chain and the deck.

5 Stairways and ladders

1 Stairways and ladders shall be provided for safe working at sea and in port. They shall be of adequate size and strength. Means of access to holds, tween-decks, bunkers and similar parts of a vessel shall consist of fixed ladders or stairs

2 Stairways of more than 1 m in height shall have handrails on both sides.

3 Treads of stairways shall be flat and specially prepared to minimize slipping.

4 Fixed vertical ladders shall be so situated as to be protected from damage and shall be so fitted as to provide clearance of 150 mm behind. The rungs of steel vertical ladders shall be made of square section steel bars with the sharp edge upwards. Where ladders are constructed with stringers, the rungs shall pass through the stringers. Handholds shall be provided where rungs or stringers are not suitable for this purpose.

5 Emergency escape ladders shall normally be fixed, but may be portable provided that they are stowed adjacent to the escape and that they can be secured in place when required without tools or mechanical aids.

6 Ladders in machinery and boiler spaces shall preferably be at least 450 mm wide.

6 Accommodation ladders and gangways

1 An accommodation ladder, gangway or similar appliances shall normally be provided to ensure sufficiently safe and convenient access to the vessel.

2 If an accommodation ladder or gangway is not practicable, a substantial straight ladder, of adequate length and extending at least 900 mm above the upper landing surface, shall be provided. Where conditions are such that a ladder cannot be used, a pilot ladder shall be provided.

3 Accommodation ladders and gangways shall be of reliable material, good construction and adequate strength, and be securely installed.

4 Accommodation ladders and gangways shall be at least 550 mm wide and be fitted with railings at least 1 m high measured perpendicularly to the appliance on both sides, consisting of two rails or taut ropes, wires or chains about 500 mm apart and supported by stanchions not more than 2 m apart which shall be designed to be secured against inadvertent dislodgement.

5 Accommodation ladders shall be provided with hooks or other suitable fastenings for adequate support and securing against displacement or slipping and be able to be adjusted to the height of the landing place.

6 When a fixed tread accommodation ladder is fitted, cleated duck boards shall be provided which can be secured over the front edges of ladder steps to form a gangway when the ladder angle is low enough to require this for safety.

7 Gangways shall be fitted with cleats (transverse treads) at suitable stepping intervals and for the full width of the gangway.

8 Turntables of gangways which pivot or swivel horizontally on a platform shall be adequately protected by railings or ropes.

9 The lower end of accommodation ladders or gangways shall have suitable angle plates or guards to cover wheels or rollers and to serve as a runway to the landing surface.

10 Where the shipboard ends of the means of access rest on the top of the bulwark, steps equipped with at least one handrail of 900 mm in height shall be provided which can be secured between the top of the bulwark and the vessel’s deck.

7 Galleys

1 Adequate grab rails shall be fitted.

2 Dangerous parts of food-processing machinery shall be fitted with permanent safety guards.

3 Cooking stoves shall be fitted with guards to retain cooking utensils.

4 Galley floor areas shall be adequately drained. The anti-skid surface referred to in paragraph paragraph 2.5 shall be designed to facilitate drainage.

5 Machinery, such as pumps and domestic refrigeration compressor units situated in the galley shall be fitted with permanent safety guards.

8 Deck machinery, tackle and lifting gear

General

1 All elements of a fishing gear system, including warping heads, winches, warps, wires, tackle, nets, etc., shall be designed, arranged and installed to provide safe and convenient operation. In so far as is possible, such components shall be of a suitable strength so that, in the event of an overload strain, the failure will occur on the designated weak link in the system. All crew members shall be made aware of the designated weak link in the system.

2 Warp guards shall be fitted where practicable between warp lead rollers.

3 Sheaves and rollers shall be guarded where practicable.

4 Chains or other suitable devices shall be provided for “stoppering off”.

5 Wires and warps provided shall be of adequate strength for the anticipated loads.

6 Where practicable, provision shall be made to stop trawl boards swinging inboard, such as the fitting of a portable prevention bar at the gallows aperture or other equally effective means.

7 Lifting and running parts of the fishing gear shall be of adequate strength for the anticipated loads.

8 Provision shall be made for the stowage of bulky netting to allow for drainage and to prevent lateral movement. The stowage area shall be of adequate dimensions to keep the centre of gravity of the stowed net to a minimum and to allow for the crew to work in safety when flaking down nets.

9 Moving parts of winches line and net hauling equipment and of warp and chain leads which may present a hazard shall be as far as practicable adequately guarded and fenced.

10 Controls of winches, line and net hauling equipment, shall be so placed that winch operators have ample room for their unimpeded operation and have as unobstructed a view as possible of the working area. Where possible, control handles shall be arranged to return to the stop position when released and be provided, where necessary, with a suitable locking device in the stop/neutral position, to prevent accidental movements or displacement or unauthorized use. In general, winches and hauling equipment for fishing gear shall be fitted with safety devices designed to prevent accidents.

11 The arrangement of the safety devices shall also ensure that an emergency stop would be activated if a person is pulled towards a winch or other hauling equipment.

12 Quick release devices shall preferably be fitted in the case of beam trawling and in purse seining that can be activated in an emergency from the wheelhouse and at the main control station if not in the wheelhouse.

13 The design and construction of winches, line and net hauling equipment shall be such that the maximum effort necessary for operating handwheels, handles, crank handles, levers, etc. shall not exceed 160 N and in the case of pedals not exceed 320 N.

Winches

14 The design of winch systems shall ensure that, when power is supplied to the winch, the control valves and levers will always be in the stop/neutral position.

15 Winches shall be provided with means to prevent overhoisting and to prevent the accidental release of a load if power supply fails. Where practicable, winches with wire storage drums shall be fitted to avoid the need to use warping heads.

16 Winches shall be equipped with brakes capable of effectively arresting and holding the safe working load. Brakes shall be proof-tested before installation with a static load suitably in excess of the maximum safe working load. Brakes shall be provided with simple and easily accessible means of adjustment. Every winch drum, which could be uncoupled from the drive, shall be furnished with a separate brake independent of the brake connected with the drive.

17 Where manually-operated "guiding on" gear is installed, the operating wheels shall be without open spokes or protrusions that could cause injury to the operator and shall be capable of being disengaged when the warps are paying out. Preferably the "guiding on" gear shall be capable of being disengaged when the warps are paying out.

18 Winches shall be reversible.

19 Winch barrels shall be provided with means for fastening wire ends, for instance clamps, shackles or other equally effective method which shall be so designed as to prevent kinking of the wires.

20 Where a fishing winch is provided with local and remote controls, these shall be so arranged as to prevent simultaneous operation. The operator shall have a clear view of the winch and adjacent area from either position. An emergency cut-off shall be provided at the winch and at the remote station as well as in the wheelhouse.

21 Where a fishing winch is controlled from the wheelhouse, an emergency control switch at the winch shall be provided. Where a second control at the winch is required by the Administration, the arrangement shall be such as to make simultaneous control from both control positions impossible, as well as to show which control position is in operation. Where necessary, emergency switches for winches shall be provided remote from the winch to protect fishermen working in places which are dangerous for operation of warps and trawl boards. Where a fishing winch is controlled from the bridge, the arrangements shall be such that the operator has a direct or televised clear view of the winch and adjacent area.

Line and net hauling equipment

22 Line and net hauling equipment shall be fitted with devices to ensure that the designated safe working load is not exceeded. Such devices shall be periodically tested.

23 Where line and net hauling equipment is intended to be blocked or braked in the stop position, the arrangements shall be periodically tested.

24 Where line and net hauling equipment is controlled from the wheelhouse or from a position remote from the equipment, means shall be provided at the equipment to stop hauling

and/or shooting in an emergency. In like manner, when the main controls are at the equipment, means shall be provided in the wheelhouse to stop it in an emergency.

25 The arrangement of the safety devices shall also ensure that an emergency stop would be activated if a person is pulled towards a line or net hauling equipment.

Lifting gear

26 Cranes shall be well constructed of sound material and the design shall conform with national standards that may be appropriate. They shall be periodically tested and the crane shall be marked with the designated maximum safe working load. In the case of a crane fitted with an extendable jib, the safe working load at various radii shall be clearly marked as close as practical to the operating controls.

27 In general, cranes adapted to carry net hauling equipment shall be so designed that in the fail safe condition, the hanging point of the jib shall not be too high or extend so far beyond the bulwark that retrieval of fishing gear or equipment would endanger the crew.

28 The braking or blocking arrangements of a crane shall be tested to at least 1.5 times the designated safe working load.

29 Lifting and hoisting appliances, as well as derricks and similar equipment including all parts of the working gear thereof, whether fixed or movable, and all plant shall be of good construction, reliable material, adequate strength and free from patent defect. They shall be adequately and suitably anchored, supported or suspended having regard to the purpose for which they are used and shall be marked with the safe working load. They shall have easy access for maintenance. Guards shall be provided to prevent any undesirable movement of lifted or hoisted parts, such as codend or fishing gear, which could present danger to the crew.

30 Lifting and hoisting appliances, as well as derricks, shall be protected from overhoisting.

31 The Administration shall ensure that lifting and hoisting appliances, as well as derricks, shall be tested at least every two years and the results entered in the record of the vessel.

32 No such appliance of a kind referred to in paragraph 27 nor any part or working gear thereof, shall be taken into use for the first time or after it has undergone any substantial repair unless it has been tested and the result entered in the record of the vessel.

9 Lighting in working spaces and areas

1 All companion-ways, doors or other means of access shall be illuminated on both sides of the opening to facilitate safe passage.

2 All passageways and working spaces and areas shall be provided with artificial lighting. Particular attention shall be paid to Rule 20(b) of the International Regulations for Preventing Collisions at Sea, 1972.

3 Glare, dazzle or sudden contrasts of illumination shall be eliminated to the extent possible taking into consideration the need for effective lighting for the safety of the crew on the working deck.

4 Provision shall be made for some form of emergency lighting, which is independent of the normal supply.

5 Portable watertight lights shall be provided as necessary and fitted with heavy-duty cables, bulb guards and lanyards. Such lights for use in spaces, which may contain explosive gases, shall be either explosive proof or otherwise intrinsically safe.

6 Where necessary to prevent danger, electric lamps shall be protected by guards.

7 In order to avoid the stroboscopic effect of fluorescent lighting, double tube lamps shall be used to illuminate working spaces with revolving machinery.

10 Ventilation in working and storage spaces

1 Enclosed working spaces, machinery spaces and spaces used for storage, in particular, of paints, oils, solvents and wet batteries shall be adequately ventilated and in accordance with paragraphs 10, 30 and 47 of chapter 5.

2 Where necessary to safeguard personnel, work places and storage spaces shall be provided with an adequate system of heating and/or cooling.

11 Dangerous areas

1 Dangerous spaces or entrances thereto shall be properly illuminated and marked and have warning signs prominently posted. Retro-reflective and fluorescent materials may be used to increase the conspicuousness. A notice shall also be posted if a first aid procedure is appropriate.

2 A notice shall be posted below radar and radio aerials warning that no work shall be undertaken in the vicinity without authorization. A notice shall also be posted at the operating controls of radar and radio equipment warning the operator that the equipment shall not be started unless it is clear that no one is working near the aerials.

3 A working area, designated by the skipper as dangerous or requiring extra care, shall be brought to the attention of the crew at regular briefing sessions on safety and to each new crew member on joining a vessel.

12 Fish processing equipment

1 Arrangement of fish processing equipment shall ensure free access for inspection, operation and sanitary treatment of the equipment. Working areas in way of processing equipment shall be not less than 750 mm wide.

2 Materials used to insulate fish processing equipment, including piping, shall be non-combustible, durable and stable under conditions of vibration and shall not have an external surface temperature harmful to personnel on contact. The insulation shall be securely fastened.

3 Machinery and installations operating under pressure shall comply with requirements of the Administration and can refer to requirements applicable to similar shore installations.

4 Machinery and other installations from which vapour, gas, dust or other harmful substance may readily escape or be emitted during operation shall be fitted with exhaust

devices. Suction ends of these devices shall be located as near as possible to the sources of vapour, gas, dust or other harmful substance and the piping shall be so arranged that discharged products will not constitute a hazard to personnel.

5 Where conveyors are working in one line, emergency switches shall be provided at intervals of not more than 3 m for stopping all conveyors working in the line. Where the length of a conveyor or series of conveyors is 10 m or more, sound or light signals shall be provided for giving warning when the conveyor system starts.

6 Dampers, cocks, valves and other stopping devices shall be positioned so that they are readily accessible and safe for operation.

7 Machinery and equipment in working spaces shall be fitted on strong and rigid foundations securely connected to the vessel's structure.

8 Moving parts of machinery and other equipment or installations, as well as gear wheels, which may present a hazard, shall be adequately guarded.

9 Machinery and installations which require routine servicing at a height of more than 2 m shall be equipped with platforms of 600 mm in width and guarded with rails not less than 1 m in height.

10 Fish processing equipment operating with water shall be provided with effective drainage systems, having regard to their extra susceptibility to clogging.

11 Adequate drainage shall be provided to prevent the accumulation of water in enclosed spaces as a consequence of fish handling or fish processing.

12 Loading and unloading devices for fish processing machinery and equipment shall be arranged at a safe and convenient height for operation.

13 Steam or vapour outlets from machinery and equipment such as liver boilers, shall be arranged as high as possible. Outlet pipes shall be at least 50 mm in diameter and lead into open air. Vapour from outlets shall not obscure visibility.

14 Filling openings of machinery and other equipment, such as liver or fish oil boilers, shall be within easy reach of personnel. Such openings shall be fitted with lids with suitable means of closing so as to prevent steam, hot water or vapour escaping into the working space. The lids shall also be counterbalanced or provided with other safe means of securing the lid in the open position.

13 Medicine chest, radio-medical services and hospital accommodation

1 First aid equipment and instructions as required by the Administration shall be provided in all fishing vessels. International standards relating to first aid at sea laid down in the International Medical Guide for Ships, prepared by the International Labour Organization, the International Maritime Organization and the World Health Organization, may serve as a guide. In addition, in recent years regional guidelines have also been developed.13

2 Fishing vessels shall carry an appropriate medical guide or instructions. The medical guide or instructions, shall be illustrated, shall explain how the medical supplies are to be used

and shall be designed to enable persons other than a doctor to care for the sick or injured on board both with and, if necessary, without medical advice by radio or satellite communication.

3 The medicine chest shall contain equipment and medical supplies suitable for the expected service of the vessel (e.g., unlimited trips; trips of less than a certain distance from the nearest port with adequate medical equipment; service in harbours and very close to shore).

4 The Administration shall establish requirements for the periodic replacement of medicines to ensure they are not outdated and appropriate to any changes in the operational requirements of the vessel (e.g., change in geographic location).

5 Appropriate instructions and equipment shall be provided to enable appropriate fishing vessel personnel to consult effectively with radio-medical services ashore.

6 Appropriate hospital accommodation shall be provided in accordance with international instruments.

7 Instructions and equipment necessary for safe medical evacuation by vessel, helicopter or other means shall be carried on board.

8 Generally, all instructions shall be in a language understood by the crew. Where possible, illustrations shall be used to facilitate ease of understanding and communication.

14 Miscellaneous

1 Protective clothing and safety working equipment such as gloves, goggles, ear protectors, respirators, safety helmets, special footwear, and/or other apparel, oilskins, explosive gas and oxygen sufficiency indicators, etc. shall be provided as appropriate to prevent injury or illness to personnel. The protective clothing and in particular oilskins, shall have a highly visible colour, be reflectorised, and fit as closely to the body as possible. The protective clothing for crew members working on deck shall be capable of supporting the wearer in the water in the event of being washed overboard. A buoyancy garment or a self-inflating working lifejacket could be used for this purpose.

2 Pound boards shall be so constructed that they can be locked in position when in use and shall not hamper the discharge of shipped water.

3 Effective lightning protectors shall be fitted to all wooden masts or topmasts. In vessels built of steel, it is sufficient to fit spikes on steel masts. In vessels constructed of non-conductive material the lightning conductors shall be connected to a copper plate fixed to the vessel’s hull well below the waterline.

4 In designing and installing new machinery and equipment in vessels, measures shall be taken to reduce the effect of noise and vibration upon personnel to levels satisfactory to the Administration.

5 Excessive and harmful noise and vibration shall, as far as possible, be eliminated. When harmful noise cannot be eliminated, ear protectors shall be available to personnel.

6 An explosive gas detector and a detector or detectors to test for the leakage of refrigerant or refrigerants shall be provided on board.

7 The Administration shall ensure that fishing vessels that carry cargo and/or fishing equipment on deck and/or a top deckhouses, carry on board clear instructions in relation to:

.1 the provisions in the stability booklet covering conditions of loading at various freeboards;

.2 permitted loading conditions relative to weather conditions;

.3 ensuring that cargo/fishing gear is not stowed in a manner that would obscure view from the bridge or obscure navigation lights and signals; and

.4 ensuring that access to, and the operation of, essential equipment and machinery is not impeded.

CHAPTER 7

LIFE-SAVING APPLIANCES PART A – GENERAL

1 Application to existing ships

The provisions of the present chapter shall apply to existing ships.

2 Definitions

1 Float-free launching is that method of launching a survival craft whereby the craft is automatically released from a sinking vessel and is ready for use.

2 Free-fall launching is that method of launching a survival craft whereby the craft with its complement of persons and equipment on board is released and allowed to fall into the sea without any restraining apparatus.

3 Inflatable appliance is an appliance which depends upon non-rigid, gas-filled chambers for buoyancy and which is normally kept uninflated until ready for use.

4 Inflated appliance is an appliance which depends upon non-rigid, gas-filled chamber for buoyancy and which is kept inflated and ready for use at all times.

5 Launching appliance or arrangements is a means of transferring a survival craft or rescue boat from its stowed position safety to water.

6 Novel life-saving appliance or arrangements is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of this chapter but which provides an equal or higher standard of safety.

7 Rescue boat is a boat designed to rescue persons in distress and to marshal survival craft.

8 Retro-reflective material is a material which reflects in the opposite direction a beam of light directed on it.

9 Survival craft is a craft capable of sustaining the lives of persons in distress from the time of abandoning the vessel.

3 Evaluation, testing and approval of life-saving appliances and arrangements14

1 Except as provided in paragraph 6, life-saving appliances and arrangements to which this chapter refers shall be approved by the Administration in accordance with the requirements on the approbation of marine safety equipment.

2 Before giving approval to life-saving appliances and arrangements, the Administration shall ensure that such life-saving appliances and arrangements:

.1 are tested to confirm that they comply with the guidelines given in this chapter and with the recommendations of the International Maritime Organization; or

.2 have successfully undergone, to the satisfaction of the Administration, tests which are substantially equivalent to those specified in the recommendations of the International Maritime Organization.

3 Before giving approval to novel life-saving appliances or arrangements, the Administration shall ensure that such appliances or arrangements:

.1 provide safety standards at least equivalent to the guidelines given in this chapter and the applicable provisions of the Protocol of Torremolinos, 1993, on Safety of Fishing Vessels and have been evaluated and tested in accordance with the recommendations of the International Maritime Organization; or

.2 have successfully undergone, to the satisfaction of the Administration, evaluation and tests which are substantially equivalent to those recommendations given in IMO resolutions on testing of life-saving appliances and arrangements.

4 Procedures adopted by the Administration for approval shall also include the conditions whereby approval will continue or will be withdrawn.

5 Part C of chapter VII of the Protocol of Torremolinos, 1993, on Safety of Fishing Vessels shall be used as guidance for the requirements for live-saving appliances.

6 Life-saving appliances referred to in this chapter for which specifications are not included in applicable provisions of the Protocol of Torremolinos shall be to the satisfaction of the Administration.

4 Production tests

The Administration shall require proof that life-saving appliances have been subjected to such production tests as are necessary to ensure that the life-saving appliances are manufactured to the same standard as the approved prototype.

PART B – VESSEL REQUIREMENTS

5 Number and types of survival craft

1 Every vessel shall be provided with survival craft of sufficient aggregate capacity to accommodate at least 200% of the total number of persons on board. There shall be a sufficient number of survival craft to accommodate at least the total number of persons on board, which shall be capable of being launched from either side of the vessel. The Administration may

admit a relaxation to this paragraph taking into account the vessel's navigation area, operational condition, size of the vessels and may permit to provide vessels with survival craft of sufficient aggregate capacity to accommodate at least the total number of persons on board.

2 Survival craft shall comply with the applicable provisions of the Protocol of Torremolinos, 1993, on Safety of Fishing Vessels. Alternatively, the Administration may permit vessels to carry other types of approved survival craft, taking into account the vessel's navigational and operational condition.

3 The vessel shall be provided with a rescue boat. A survival craft can be used as a rescue boat provided it is suitable for this purpose. If the Administration admits that the vessel itself can be used as a rescue boat, and where means for rescuing a person overboard are provided on the vessel, a rescue boat is not necessary. A rescue boat shall be capable of being easily launched by a minimum number of crewmembers, easily propelled and highly manoeuvrable and adequate for rescuing a person overboard. Normally, only rigid boats are considered suitable as a rescue craft, but permanently inflated rubber boats of strong abrasion resistant construction with subdivided buoyancy may be accepted as rescue boats.

6 Availability and stowage of survival craft

1 Survival craft shall:

.1 be readily available in case of emergency;

.2 be capable of being launched safely and rapidly under the conditions required by the applicable provisions of the Torremolinos Protocol, 1993;

.3 be so stowed that:

.1 the marshalling of persons at the embarkation deck is not impeded;

.2 their prompt handling is not impeded;

.3 embarkation can be effected rapidly and in good order; and

.4 the operation of any other survival craft is not interfered with.

2 Survival craft and launching appliances shall be in working order and available for immediate use before the vessel leaves port and kept so at all times when at sea.

3 Stowage

.1 Survival craft shall be stowed to the satisfaction of the Administration.

.2 Every lifeboat shall be attached to a separate set of davits or approved launching appliance.

.3 Survival craft shall be positioned as close to accommodation and service spaces as possible, stowed in suitable positions to ensure safe launching, with particular regard to clearance from the propeller.

.4 Lifeboats for lowering down the vessel's side shall be stowed with regard to steeply overhanging portions of the hull, so ensuring, as far as practicable, that

they can be launched down the straight side of the vessel. If positioned forward, they shall be stowed abaft the collision bulkhead in a sheltered position and in this respect the Administration shall give special consideration to the strength of the davits.

.5 Liferafts shall be so stowed as to be readily available in case of emergency in such a manner as to permit them to float free from their stowage and break free from the vessel in the event of its sinking. However, davit- launched liferafts need not float free.

.6 Lashings, if used, shall be fitted with an automatic release system of an approved type.

.7 The Administration, if satisfied that the constructional features of the vessel and the method of fishing operation may render it unreasonable and impractical to apply particular provisions of this paragraph, may accept relaxation from such provisions, provided that the vessel is fitted with alternative launching and recovering arrangements adequate for the service for which it is intended.

7 Embarkation into survival craft

Suitable arrangements shall be made for embarkation into the survival craft which shall include:

.1 at least one ladder, or other approved means, on each side of the vessel to afford access to the survival craft when waterborne, except where the Administration is satisfied that the distance from the point of embarkation to the waterborne survival craft is such that a ladder is unnecessary;

.2 means for illuminating the stowage position of survival craft and their launching appliances during preparation for and the process of launching, and also for illuminating the water into which the survival craft are launched until the process of launching is completed, the power for which to be supplied from the emergency source required by paragraph 11 of chapter 4;

.3 arrangements for warning all persons on board that the vessel is about to be abandoned; and

.4 means for preventing any discharge of water into the survival craft.

8 Lifejackets

1 For every person on board, a lifejacket of an approved type shall be carried.

2 Lifejackets shall be so placed as to be readily accessible and their position shall be plainly indicated.

9 Immersion suits and thermal protective aids

1 For vessels operating in areas where low water or air temperature can be expected, an approved immersion suit of an appropriate size shall be provided for every person on board.

2 Where the Administration considers that water or air temperatures in the area of operations of the vessel warrant immersion suits with inherent insulation, these suits shall be provided for every person on board.

3 Immersion suits shall be placed as to be readily accessible and their position shall be clearly indicated.

10 Lifebuoys

1 At least four lifebuoys shall be provided.

2 At least half of the number of lifebuoys referred to in 1 shall be provided with self-igniting lights.

3 At least one of the lifebuoys provided with self-igniting lights in accordance with 2 shall be provided with self-activating smoke signals.

4 At least one lifebuoy on each side of the vessel shall be fitted with a buoyant lifeline equal in length to not less than 30 m. Such lifebuoys shall not have self-igniting lights.

5 All lifebuoys shall be so placed as to be readily accessible to the persons on board and shall always be capable of being rapidly cast loose and shall not be permanently secured in any way.

6 All lifebuoys shall be in a bright contrasting colour to the sea and marked with the same registration or other identification marks as used for the vessel as referred to in paragraph 16.

11 Line-throwing appliances

For every vessel a line-throwing appliance of a type approved by the Administration shall be provided, being capable of carrying with reasonable accuracy a line not less than 230 m in length.

12 Distress signals

1 Every vessel shall be provided with means of making effective distress signals by day and by night, including at least four rocket parachute flares.

2 Distress signals shall be of an approved type. They shall be so placed as to be readily accessible and their position shall be plainly indicated.

13 Radio life-saving appliances

At least two two-way VHF radiotelephone apparatus shall be provided on every vessel. Such apparatus shall conform to performance standards not inferior to those adopted by the Administration having regard to those adopted by the International Maritime Organization. If a fixed two-way VHF radiotelephone apparatus is fitted in a survival craft, it shall conform to performance standards not inferior to those adopted by the Administration having regard to those adopted by the International Maritime Organization.

14 Radar transponder15

At least one radar transponder shall be carried on every vessel. Such radar transponders shall conform to performance standards not inferior to those adopted by the Administration, having regard to those adopted by the International Maritime Organization. It shall be stowed in such a location that it can be rapidly placed in any survival craft.

15 Retro-reflective materials on life-saving appliances

All survival craft, rescue boats, lifejackets, immersion suits and lifebuoys shall be fitted with retro-reflective material in accordance with the recommendations of the International Maritime Organization.

16 Operational readiness, maintenance and inspections

Operational readiness

1 Before the vessel leaves port and at all times during the voyage, all life-saving appliances shall be in working order and ready for immediate use.

Maintenance

2 Instructions for on-board maintenance of life-saving appliances shall be carried on board.

3 The Administration may accept, in lieu of the instructions required by 2, a shipboard planned maintenance programme.

Maintenance of falls

4 Falls used in launching shall be turned end for end at intervals of not more than 30 months and be renewed when necessary due to deterioration of the falls or at intervals of not more than five years, whichever is the earlier.

Spares and repair equipment

5 Spares and repair equipment shall be provided for life-saving appliances and their components which are subject to excessive wear or consumption and need to be replaced regularly.

Weekly inspection

6 The following tests and inspections shall be carried out weekly:

.1 all survival craft and launching appliances shall be visually inspected to ensure that they are ready for use;

.2 all engines in lifeboats shall be run ahead and astern for a total period of not less than 3 min provided the ambient temperature is above the minimum temperature required for starting the engine; and

.3 the general emergency alarm system shall be tested.

Monthly inspections

7 Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using a checklist to ensure that they are complete and in good order. A report of the inspection shall be entered in the log-book.

Servicing of inflatable liferafts and inflatable lifejackets

8 Every inflatable liferaft and inflatable lifejacket shall be serviced:

.1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months; and

.2 at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

Periodic servicing of hydrostatic release units

9 Hydrostatic release units shall be serviced:

.1 at intervals not exceeding 12 months. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months; and

.2 at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

10 In cases of vessels, where the nature of fishing operations may cause difficulty for compliance with the requirements of 8 and 9, the Administration may allow the extension of the service intervals to 24 months, provided that the Administration is satisfied that such appliances are so manufactured and arranged that they will remain in satisfactory condition until the next period of servicing.

16 Miscellaneous

1 To facilitate aerial rescue operations, wheelhouse tops or other prominent horizontal surfaces shall be painted in a highly visible colour and shall bear the vessel’s registration or other identification marks in letters and/or numerals in contrasting colours to the background. Similar marks on the sides of the wheelhouse would also facilitate search and identification by high-speed aircraft.16

2 The skipper shall ensure that the crew is adequately trained in the use and inspection of life-saving appliances and that regular inspection of the equipment is carried out.

PART C – LIFE-SAVING APPLIANCES REQUIREMENTS

Part C of chapter VII of the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as modified by the Torremolinos Protocol of 1993 relating thereto shall be used as reference to requirements for life-saving appliances.

CHAPTER 8
EMERGENCY PROCEDURES AND SAFETY TRAINING

1 Application to existing ships

The provisions of the present chapter shall also apply to exiting vessels.

2 General emergency alarm system, muster list and emergency instructions

1 The general emergency alarm system shall be capable of sounding the general alarm signal consisting of seven or more short blasts followed by one long blast on the vessel's whistle or siren and additionally on an electrically operated bell or klaxon or other equivalent warning system which shall be powered from the vessel's main supply and the emergency source of electrical power required by paragraph 4.11. As an alternative, an appropriate manual system shall be used on vessels of a length less than 17 m.

2 All vessels shall be provided with clear instructions for each crew member which shall be followed in case of emergency.

3 The muster list shall be posted up in several parts of the vessel and, in particular, in the wheelhouse, the engine room and in the crew accommodation and shall include the information specified in the following paragraphs.

4 The muster list shall specify details of the general alarm signal prescribed by paragraph 1 and also the action to be taken by the crew when this alarm is sounded. The muster list shall also specify how the order to abandon ship will be given.

5 The muster list shall show the duties assigned to the different members of the crew including:

.1 closing of watertight doors, fire doors, valves, scuppers, overboard shoots, sidescuttles, skylights, portholes and other similar openings in the vessel;

.2 equipping the survival craft and other life-saving appliances;

.3 preparation and launching of survival craft;

.4 general preparation of other life-saving appliances;

.5 use of communication equipment; and

.6 manning of fire parties assigned to deal with fires.

6 The Administration may permit relaxation of the requirements of paragraph 5 if satisfied that, due to the small number of crew members, no muster list is necessary.

7 The muster list shall specify which of the crew members are assigned to ensure that the life-saving and fire appliances are maintained in good condition and are ready for immediate use.

8 The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

9 The muster list shall be prepared before the vessel proceeds to sea. After the muster list has been prepared, if any change takes place in the crew which necessitates an alteration in the muster list, the skipper shall either revise the list or prepare a new list.

3 Abandon ship training and drills

Practice musters and drills

1 Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. However, the Administration may modify this requirement, provided that at least one abandon ship and one fire drill is held at least every three months. The drills of the crew shall take place within 24 hours of the vessel leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular vessel in the previous muster. The Administration may accept other arrangements that are at least equivalent for those classes of vessel for which this is impracticable.

2 Each abandon ship drill shall include:

.1 summoning of crew to muster stations with the general emergency alarm and ensuring that they are made aware of the order to abandon ship specified in the muster list;

.2 reporting to stations and preparing for the duties described in the muster list;

.3 checking that crew are suitably dressed;

.4 checking that lifejackets are correctly donned;

.5 lowering of at least one lifeboat after any necessary preparation for launching;

.6 starting and operating the lifeboat engine;

.7 operation of davits used for launching liferafts.

3 Each fire drill shall include:

.1 reporting to stations and preparing for the duties described in the fire muster list;

.2 starting of a fire pump, using the required jets of water to show that the system is in proper working order;

.3 checking of fireman’s outfit and other personal rescue equipment;

.4 checking of relevant communication equipment;

.5 checking the operation of watertight doors, fire doors, fire dampers and means of escape; and

.6 checking the necessary arrangements for subsequent abandoning of the vessel.

4 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of 2.5 at successive drills.

5 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

6 Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon ship drill.

7 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water. In all cases, this requirement shall be complied with at least once every 3 months.

8 If lifeboat and rescue boat launching drills are carried out with the vessel making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills.

9 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

10 The drills may be adjusted according to the relevant equipment required by those requirements. However, if equipment is carried on a voluntary basis, it shall be used in the drills and the drills shall be adjusted accordingly.

On-board training and instructions

11 On-board training in the use of the vessel’s life-saving appliances, including survival craft equipment, shall be given as soon as possible but not later than 2 weeks after a crew member joins the vessel. However, if the crew member is on a regularly scheduled rotating assignment to the vessel, such training shall be given not later than 2 weeks after the time of first joining the vessel.

12 Instructions in the use of the vessel's life-saving appliances and in survival at sea shall be given at the same intervals as the drills. Individual instruction may cover different parts of the vessel's life-saving system, but all the vessel's life-saving equipment and appliances shall be covered within any period of 2 months. Each member of the crew shall be given instructions which shall include but not necessarily be limited to:

.1 operation and use of the vessel's inflatable liferafts, including precautions concerning nailed shoes and other sharp objects;

.2 problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures; and

.3 special instructions necessary for use of the vessel's life-saving appliances in severe weather and severe sea conditions.

13 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every vessel fitted with such appliances. Whenever practicable, this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the vessel’s life-saving equipment; such a special liferaft shall be conspicuously marked.

Records

14 The date when musters are held, details of abandon ship drills and fire drills, drills of other life-saving appliances and on-board training shall be recorded in such log-book as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the log-book stating the circumstances and the extent of the muster, drill or training session held.

Training manual

15 A training manual shall be provided in each crew mess room and recreation room or in each crew cabin. The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided in the vessel and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

.1 donning of lifejackets and immersion suits, as appropriate;

.2 muster at the assigned stations;

.3 boarding, launching and clearing the survival craft and rescue boats;

.4 method of launching from within the survival craft;

.5 release from launching appliances;

.6 methods and use of devices for protection in launching areas, where appropriate;

.7 illumination in launching areas;

.8 use of all survival equipment;

.9 use of all detection equipment;

.10 with the assistance of illustrations, the use of radio life-saving appliances;

.11 use of drogues;

.12 use of engine and accessories;

.13 recovery of survival craft and rescue boats including stowage and securing;

.14 hazards of exposure and the need for warm clothing;

.15 best use of the survival craft facilities in order to survive;

.16 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus and vessel's line-throwing apparatus;

.17 all other functions contained in the muster list and emergency instructions; and

.18 instructions for emergency repair of the life-saving appliances.

16 On vessels of less than 45 m in length, the Administration may permit relaxation of the requirements of 15. However, appropriate safety information shall be carried on board.

4 Training in emergency procedures

The Administration shall take such measures as it may deem necessary to ensure that crews are adequately trained in their duties in the event of emergencies. Such training shall include, as appropriate:

.1 types of emergencies which may occur, such as collisions, fire and foundering;

.2 types of life-saving appliances normally carried on vessels;

.3 need to adhere to the principles of survival;

.4 value of training and drills;

.5 need to be ready for any emergency and to be constantly aware of:

.5.1 the information in the muster list, in particular:

.1 each crew member's specific duties in any emergency;

.2 each crew member's own survival station; and

.3 the signals calling the crew to their survival craft or fire stations;

.5.2 location of each crew member's own and spare lifejackets;

.5.3 location of fire alarm controls;

.5.4 means of escape;

.5.5 consequences of panic;

.6 actions to be taken in respect to lifting persons from vessels and survival craft by helicopter;

.7 actions to be taken when called to survival craft stations, including:

.7.1 putting on suitable clothing;

.7.2 donning of lifejacket; and

.7.3 collecting additional protection such as blankets, time permitting;

.8 actions to be taken when required to abandon ship, such as:

.8.1 how to board survival craft from vessel and water; and

. how to jump into the sea from a height and reduce the risk of injury when entering the water;

.9 actions to be taken when in the water, such as:

.9.1 how to survive in circumstances of:

.1 fire or oil on the water;

.2 cold conditions; and

.3 shark-infested waters;

.9.2 how to right a capsized survival craft;

.10 actions to be taken when aboard a survival craft, such as:

.10.1 getting the survival craft quickly clear of the vessel;

.10.2 protection against cold or extreme heat;

.10.3 using a drogue or sea anchor;

.10.4 keeping a look-out;

.10.5 recovering and caring for survivors;

.10.6 facilitating detection by others;

.10.7 checking equipment available for use in the survival craft and using it correctly; and

.10.8 remaining, so far as possible, in the vicinity;

.11 main dangers to survivors and the general principles of survival, including:

.11.1 precautions to be taken in cold climates;

.11.2 precautions to be taken in tropical climates;

.11.3 exposure to sun, wind, rain and sea;

.11.4 importance of wearing suitable clothing;

.11.5 protective measures in survival craft;

.11.6 effects of immersion in the water and of hypothermia;

.11.7 importance of preserving body fluids;

.11.8 protection against seasickness;

.11.9 proper use of fresh water and food;

.11.10 effects of drinking sea water;

.11.11 means available for facilitating detection by others; and

.11.12 importance of maintaining morale;

.12 actions to be taken in respect to fire fighting:

.12.1 the use of fire hoses with different nozzles;

.12.2 the use of fire extinguishers;

.12.3 knowledge of the location of fire doors; and

.12.4 the use of breathing apparatus.

CHAPTER 9

RADIOCOMMUNICATIONS

PART A – GENERAL

1 Application and definitions

1 The present chapter shall apply to new and existing fishing vessels.

2 No provision in this chapter shall prevent the use by any vessel, survival craft or person in distress of any means at its disposal to attract attention, make known its position and obtain help.

3 For the purpose of this chapter, the following terms shall have the meanings defined below.

.1 Bridge-to-bridge communications means safety communications between vessels from the position from which the vessels are normally navigated.

.2 Continuous watch means that the radio watch concerned shall not be interrupted other than for brief intervals when the vessel's receiving capability is impaired or blocked by its own communications or when the facilities are under periodical maintenance or checks.

.3 Digital selective calling (DSC) means a technique using digital codes which enables a radio station to establish contact with, and transfer information to, another station or group of stations, and complying with the relevant recommendations of the International Radio Consultative Committee (CCIR).

.4 Direct-printing telegraphy means automated telegraphy techniques which comply with the relevant recommendations of the CCIR.

.5 General radiocommunications means operational and public correspondence traffic, other than distress, urgency and safety messages, conducted by radio.

.6 Inmarsat means the Organization established by the Convention on the International Maritime Satellite Organization adopted on 3 September 1976.

.7 International NAVTEX service means the co-ordinated broadcast and automatic reception on 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using the English language.17

.8 Locating means the finding of ships, vessels, aircraft, units or persons in distress.

.9 Maritime safety information means navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to vessels.

.10 Polar orbiting satellite service means a service which is based on polar orbiting satellites which receive and relay distress alerts from satellite emergency position-indicating radio beacons (satellite EPIRBs) and which provides their position.

.11 Radio Requirements means the Radio Requirements annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which is in force at any time.

.12 Sea area A1 means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available, as may be defined by a Party.18

.13 Sea area A2 means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available, as may be defined by a Party.

.14 Sea area A3 means an area, excluding sea areas A1 and A2, within the coverage of an Inmarsat geostationary satellite in which continuous alerting is available.

.15 Sea area A4 means an area outside sea areas A1, A2 and A3.

All other terms and abbreviations which are used in this chapter and which are defined in the Radio Requirements shall have the meanings as defined in those Requirements.

2 Exemptions

1 It is highly desirable not to deviate from the requirements of this chapter; nevertheless the Administration may grant partial or conditional exemptions to individual vessels from the requirements of paragraphs 5 to 9, provided:

.1 such vessels comply with the functional requirements of paragraph 3; and

.2 the Administration has taken into account the effect such exemption may have upon the general efficiency of the service for the safety of all ships and vessels.

2 An exemption may be permitted under paragraph 2.1 only:

.1 if the conditions affecting safety are such as to render the full application of paragraphs 5 to 9 unreasonable or unnecessary; or

.2 in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the vessel is equipped.

3 The Administration may exempt vessels operating always together in pair or in groups from being fully equipped in accordance with the requirements, provided that:

.1 the vessel in command fully complies with the requirements of the actual sea area;

.2 the other vessels in pair or in groups carry radio equipment sufficient for short distance distress alert and radiocommunications with the vessel in command, to the satisfaction of the Administration. Vessels "operating in a pair or group" is defined as two or more vessels operating collaboratively within a 100 nautical miles of each other except for extremely brief periods; and

.3 this exemption does not apply to EPIRB carriage requirements.

3 Functional requirements

Every vessel, while at sea, shall be capable:

.1 except as provided in paragraphs 6.1.1 and 8.1.4.3, of transmitting ship-to- shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

.2 of receiving shore-to-ship distress alerts;

.3 of transmitting and receiving ship-to-ship distress alerts;

.4 of transmitting and receiving search and rescue co-ordinating communications;

.5 of transmitting and receiving on-scene communications;

.6 of transmitting and, as required by paragraph 1.5 of chapter 10, receiving signals for locating;

.7 of transmitting and receiving maritime safety information;

.8 of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks subject to paragraph 13.7; and

.9 of transmitting and receiving bridge-to-bridge communications.

PART B – SHIP REQUIREMENTS

4 Radio installations

1 Every vessel shall be provided with radio installations capable of complying with the functional requirements prescribed by paragraph 3 throughout its intended voyage and, unless relaxed under paragraph 2, complying with the requirements of paragraph 5 and, as appropriate for the sea area or areas through which it will pass during its intended voyage, the requirements of either paragraphs 5, 6, 7 or 8.

2 Every radio installation shall:

.1 be so located that no harmful interference of mechanical, electrical or other origin affects its proper use, and so as to ensure electromagnetic compatibility and avoidance of harmful interaction with other equipment and systems;

.2 be so located as to ensure the greatest possible degree of safety and operational availability;

.3 be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;

.4 be provided with reliable, permanently arranged electrical lighting, independent of the main and emergency sources of electrical power, for the adequate illumination of the radio controls for operating the radio installation; and

.5 be clearly marked with the call sign, the ship station identity and other codes as applicable for the use of the radio installation. This includes the Maritime Mobile Service Identities (MMSI).

3 Control of the VHF radiotelephone channels, required for navigational safety, shall be immediately available on the navigation bridge convenient to the conning position and, where necessary, facilities shall be available to permit radiocommunications from the wings of the navigation bridge. Portable VHF equipment may be used to meet the latter provision.

5 Radio equipment – General

1 Every vessel shall be provided with:

.1 a VHF radio installation capable of transmitting and receiving:

.1 DSC on the frequency 156.525 MHz (channel 70). It shall be possible to initiate the transmission of distress alerts on channel 70 from the position from which the vessel is normally navigated; and

.2 radiotelephonyon the frequencies 156.300 MHz (channel 6),

156.650 MHz (channel 13) and 156.800 MHz (channel 16);

.2 a VHF DSC watch receiver which may be separate from, or combined with, that required by 9.5.1.1.1;

.3 a radar transponder capable of operating in the 9 GHz band, which:

.1 shall be so stowed that it can be easily utilized; and

.2 may be one of those required by paragraph 13 of chapter 7 for a survival craft;

.4 a receiver capable of receiving international NAVTEX service broadcasts if the ship is engaged on voyages in any area in which an international NAVTEX service is provided. However, if a NAVTEX service is not established in the actual area the Administration may permit vessels to receive navigational warnings and safety messages by other means of reception, to the satisfaction of the Administration;

.5 a radio facility for reception of maritime safety information by the Inmarsat enhanced group calling system, if the vessel is engaged on voyages in any area of Inmarsat coverage but in which a NAVTEX or an alternative service is not

provided. However, vessels engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service, may be exempted from this requirement;

.6 a satellite emergency position-indicating radio beacon (satellite EPIRB) which shall be:

.1 capable of transmitting a distress alert either through the polar orbiting satellite service operating in the 406 MHz band or, if the vessel is engaged only on voyages within Inmarsat coverage, through the Inmarsat geostationary satellite service operating in the 1.6 GHz band;

.2 installed in an easily accessible position;

.3 ready to be manually released and capable of being carried by one person into a survival craft;

.4 capable of floating free, if the vessel sinks and of being automatically activated when afloat; and

.5 capable of being activated manually.

6 Radio equipment - Sea area A1 or sea areas within the coverage of a VHF coast station (without DSC) operating on a 24 hours a day, 7 days a week basis

1 In addition to meeting the requirements of paragraph 5, every vessel engaged on voyages exclusively in sea area A1 shall be provided with a radio installation capable of initiating the transmission of ship-to-shore distress alerts from the position from which the vessel is normally navigated, operating either:

.1 on VHF using DSC; this requirement may be fulfilled by the EPIRB prescribed by 3, either by installing the EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.2 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.3 if the vessel is engaged on voyages within coverage of MF coast stations equipped with DSC, on MF using DSC; or

.4 on HF using DSC; or

.5 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:

.5.1 an Inmarsat ship earth station; or

.5.2 the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

2 The VHF radio installation, required by paragraph 5.1.1, shall also be capable of transmitting and receiving general radiocommunications using radiotelephony.

3 Vessels engaged on voyages exclusively in sea area A1 may carry, in lieu of the satellite EPIRB required by paragraph 5.1.6, an EPIRB which shall be:

.1 capable of transmitting a distress alert using DSC on VHF channel 70 and providing for locating by means of a radar transponder operating in the 9 GHz band;

.2 installed in an easily accessible position;

.3 ready to be manually released and capable of being carried by one person into a survival craft;

.4 capable of floating free, if the vessel sinks and being automatically activated when afloat; and

.5 capable of being activated manually.

7 Radio equipment - Sea areas A1 and A2 or sea areas within the coverage of an MF coast station (without DSC) providing a continuous watch on 2182 kHz as well as a continuously operating VHF station

1 In addition to meeting the requirements of 9.5 and 9.6, every vessel engaged on voyages beyond sea area A1, but remaining within sea area A2, shall be provided with:

.1 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

.1 2,187.5 kHz using DSC; and

.2 2,182 kHz using radiotelephony;

.2 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from or combined with, that required by paragraph 1.1; and

.3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF operating either:

.3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.3.2 on HF using DSC; or

.3.3 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by an Inmarsat ship earth station, or by the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

2 It shall be possible to initiate transmission of distress alerts by the radio installations specified in 1.1 and 1.3 from the position from which the vessel is normally navigated.

3 The vessel shall, in addition, be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by either:

.1 a radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz or between 4,000 kHz and 27,500 kHz. This requirement may be fulfilled by the addition of this capability in the equipment required by 1.1; or

.2 an Inmarsat ship earth station.

4 If the vessel is operating exclusively within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is not available, but is providing a continuous watch on 2182 kHz, , the vessel need not to be equipped with the DSC functions mentioned above in paragraphs 5.1.1 and 5.1.2 and in 1.1 to 1.3.

8 Radio equipment - Sea areas A1, A2 and A3

1 In addition to meeting the requirements of paragraphs 5, 6 and 7, every vessel engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, shall, if it does not comply with the requirements of paragraph 2, be provided with:

.1 an Inmarsat ship-earth station capable of:

.1 transmitting and receiving distress and safety communications using either radiotelephony;

.2 initiating and receiving distress priority calls;

.3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas;

.4 transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy; and

.2 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

.2.1 2,187.5 kHz using DSC; and

.2.2 2,182 kHz using radiotelephony, and

.3 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from or combined with that required by 1.2.1; and

.4 means of initiating the transmission of ship-to-shore distress alerts by a radio service operating either:

.4.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated; or

.4.2 on HF using DSC; or

.4.3 through the Inmarsat geostationary satellite service, by an additional ship earth station or by the satellite EPIRB required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

2 In addition to meeting the requirements of paragraph s 5, 6, and 7, every vessel engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, shall, if it does not comply with the requirements of paragraph 8.1, be provided with:

.1 an MF/HF radio installation capable of transmitting and receiving, for distress and safety purposes, on all distress and safety frequencies in the bands between 1,609 kHz and 4,000 kHz and between 4,000 kHz and 27,500 kHz:

.1 using DSC; and

.2 using radiotelephony;

.2 equipment capable of maintaining DSC watch on 2,187.5 kHz, 8,414.5 kHz and on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz; at any time, it shall be possible to select any of these DSC distress and safety frequencies. This equipment may be separate from or combined with the equipment required by 2.1; and

.3 means of initiating the transmission of ship-to-shore distress alerts by a radiocommunication service other than HF operating either:

.3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or

by remote activation from, the position from which the vessel is normally navigated; or

.3.2 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by an Inmarsat ship earth station or the satellite EPIRB, required by paragraph 5.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the vessel is normally navigated.

3 It shall be possible to initiate transmission of distress alerts by the radio installations specified in 1.1, 1.2, 1.4, 2.1 and 2.3 from the position from which the vessel is normally navigated.

9 Watches

1 Every vessel, while at sea, shall maintain a continuous watch:

.1 on VHF DSC channel 70, if the vessel, in accordance with the requirements of paragraph 5.1.2, is fitted with a VHF radio installation;

.2 on the distress and safety DSC frequency 2,187.5 kHz, is fitted with an MF radio installation;

.3 on the distress and safety DSC frequencies 2,187.5 kHz and 8,414.5 kHz and also on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz, appropriate to the time of day and the geographical position of the vessel, if the vessel is fitted with an MF/HF radio installation. This watch may be kept by means of a scanning receiver;

.4 for satellite shore-to-ship distress alerts, if the vessel is fitted with an Inmarsat ship-earth station.

.5 on the radiotelephone distress frequency 2,182 kHz, if the vessel is operating within the radiotelephone coverage of an MF coast station in which continuous DSC alerting is not available or is not fitted with the MF DSC functions in paragraphs 7.1.1 and 7.1.2. This watch shall be kept at the position from which the vessel is normally navigated.

2 Every vessel, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the vessel is navigating.

3 Every vessel, while at sea, shall maintain, when practicable, a continuous listening watch on VHF channel 16.

10 Sources of energy

1 There shall be available at all times, while the vessel is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve source or sources of energy for the radio installations.

2 A reserve source or sources of energy shall be provided on every vessel to supply radio installations, for the purpose of conducting distress and safety radiocommunications, in the event of failure of the vessel’s main and emergency source of electrical power. The reserve source of energy shall be capable of simultaneously operating:

.1 the VHF radio installation in sea area A1;

.2 the VHF radio installation and the MF or MF/HF installation in sea area A2;

.3 the VHF radio installation and the MF or MF/HF installation or the Inmarsat station in sea area A3; and

.4 for a period of at least 3 h.

The reserve source of energy need not supply independent HF and MF radio installation at the same time.

3 The reserve source or sources of energy shall be independent of the propelling power of the vessel and the vessel's electrical system.

4 The reserve source or sources of energy may be used to supply the electrical lighting required by paragraph 4.2.4.

5 Where a reserve source of energy consists of a rechargeable accumulator battery or batteries:

.1 a means of automatically charging such batteries shall be provided which shall be capable of recharging them to minimum capacity requirements within 10 h; and

.2 the capacity of the battery or batteries shall be checked using an appropriate method, at intervals not exceeding 12 months.

11 Performance standards

All equipment to which this chapter applies shall be of a type approved by the Administration. Such equipment, except for the domestic radio installation and its ancillary equipment, shall conform to appropriate performance standards approved by the Administration, having regard to those adopted by the International Maritime Organization.

12 Maintenance requirements

1 Equipment shall be so designed that the main units can be replaced readily, without elaborate re-calibration or readjustment.

2 Where applicable, equipment shall be so constructed and installed that it is readily accessible for inspection and onboard maintenance purposes.

3 Adequate information shall be provided to enable the equipment to be properly operated and maintained taking into account the recommendations of the International Maritime Organization.

4 Adequate tools and spares shall be provided to enable the equipment to be maintained.

5 The Administration shall ensure that radio equipment required by this chapter is maintained to provide the availability of the functional requirements specified in paragraph 3 and to meet the recommended performance standards of such equipment.

6 On vessels engaged on voyages in sea area A3, the availability shall be ensured by using such methods as duplication of equipment, shore-based maintenance or at-sea electronic maintenance capability, or a combination of these, as may be approved by the Administration.

7 While all reasonable steps shall be taken to maintain the equipment in efficient working order to ensure compliance with all the functional requirements specified in paragraph 3, malfunction of the equipment for providing the general radiocommunications required by paragraph 3.8 shall not be considered as making a vessel unseaworthy or as a reason for

delaying the vessel in ports where repair facilities are not readily available, provided the vessel is capable of performing all distress and safety functions.

8 Satellite EPIRBs shall be tested at intervals not exceeding 12 months for all aspects of operational efficiency with particular emphasis on frequency stability, signal strength and coding. However, in cases where it appears proper and reasonable, the Administration may extend this period to 17 months. The test may be conducted on board the vessel or at an approved testing or servicing station.

13 Radio personnel

Every vessel shall carry personnel qualified for distress and safety radiocommunications purposes, any one of whom shall be designated to have primary responsibility for radiocommunications during distress incidents. The personnel shall be holders of certificates specified in the Radio Requirements as appropriate. Alternatively, national certificates based on the same requirements as the Radio Requirement, but taking account of particular local circumstances, may be issued.

14 Radio records

A record shall be kept, to the satisfaction of the Administration and as required by the Radio Requirements, of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea.

15 Position-updating

All two-way communication equipment carried on board a vessel to which this chapter applies which is capable of automatically including the vessel's position in the distress alert shall be automatically provided with this information from an internal or external navigation receiver, if either is installed. If such a receiver is not installed, the vessel's position and the time at which the position was determined shall be manually updated at intervals not exceeding four hours, while the vessel is underway, so that it is always ready for transmission by the equipment.

CHAPTER 10

NAVIGATIONAL EQUIPMENT

1 Application to existing ships

The provisions of paragraphs 2, 3, 4 and 6 shall apply to existing fishing vessels. paragraph 5 shall apply taking account of the provision in its paragraph 2.

2 Shipborne navigational equipment

1 Vessels shall be fitted with:

.1 a standard magnetic compass, except as provided in 1.5;

.2 adequate means of communication between the standard compass position and the normal navigation control position, to the satisfaction of the Administration; and

.3 means for taking bearings as nearly as practicable over an arc of the horizon of 360°.

2 The magnetic compass referred to in 1 shall be properly adjusted and its table or curve of residual deviations shall be available at all times.

3 A spare magnetic compass, interchangeable with the standard compass, shall be carried by vessels of 35m in length and over, unless a steering compass or a gyro-compass is fitted.

4 It shall be possible to read the compasses by day and by night. It shall also be possible to take bearings by day or by night using the standard or steering compass or a pelorus. Magnetic compasses shall be provided with means for adjustment; securing devices for compasses and compensators shall be made of nonmagnetic materials. Compasses shall be sited as near the fore-and-aft line of the vessel as practicable, with the lubber line, as accurately as possible, parallel with the fore-and-aft line. Compasses shall comply with the requirements of the Administration.

5 The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual vessels or classes of vessels from these requirements, if the nature of the voyage, the vessel's proximity to land or the type of vessel does not warrant a standard compass, provided that a suitable steering compass is in all cases carried.

6 Vessels of 45 m in length and over shall be fitted with a gyro-compass complying with the following requirements:

.1 the master gyro-compass or a gyro-repeater shall be clearly readable by the helmsman at the main steering position; and

.2 on vessels of 75 m in length and over, a gyro-repeater or gyro-repeaters shall be provided and shall be suitably placed for taking bearings as nearly as practicable over an arc of the horizon of 360°.

7 Vessels with emergency steering positions shall at least be provided with a telephone or other means of communication for relaying heading information to such positions. In addition, vessels of 45 m in length and over equipped with gyro-compass shall be provided with arrangements for supplying visual compass readings to the emergency steering position.

8 In vessels equipped with an auto-pilot system actuated by a magnetic sensor, which does not indicate the vessel's heading, suitable means shall be provided to show this information. Auto-pilot systems shall comply with the requirements of the Administration.

3 Nautical instruments, publications and distress signalling equipment

1 Every vessel shall carry on board the following equipment: 1 radar capable of operating in the 9 GHz frequency band

1 radar reflector if the hull of the vessel is of non metallic material

1 GNSS receiver

1 echo sounder (fish-finding devices, if fitted, can be used for that purpose)

1 hand sounding lead

1 barometer

1 thermometer

1 list indicator

1 pair of binoculars

4 red rockets signal of parachute type 2 hand red flares

2 floating smoke signal 1 national flag

1 set of flags N and C of the International Code of Signals 1 set of day marks

1 watertight light torch 1 set of updated charts 1 protractor

1 divider

1 binnacle clock

1 set of tools 1 boat hook

1 set of assorted ropes and cables 1 bag of quick-setting glue

1 illustrated table of rescue signals

the sailing directions

the list of lights

the tidal tables

all other nautical publications necessary for the area concerned

the requirements for the prevention of collisions at sea

the International Code of Signals

2 All equipment fitted in compliance with this section shall be of a type approved at the discretion of the Administration. Equipment installed on board vessels shall conform to appropriate performance standards. Such standards, wherever applicable, shall not be inferior to those adopted by the Interantional Maritime Organization.

4 Signalling equipment

1 Attention is drawn to the need to provide the equipment to comply in every respect with the requirements of the International Regulations for Preventing Collisions at Sea, 1972, as amended.

2 Lights, shapes and flags shall be provided to indicate that the vessel is engaged in any specific operation for which such signals are used.

3 A daylight signalling lamp shall be provided, the operation of which is not solely dependent upon the main source of electrical power. The power supply shall in any case include a portable battery.

4 Vessels intended for fishing operations in unlimited sea areas and vessels of 45 m in length and over shall be provided with a full complement of flags and pendants to enable communications to be sent using the International Code of Signals.

5 Navigating bridge visibility

1 Vessels of 45 m in length and over shall meet the following requirements:

.1 the view of the sea surface from the conning position shall not be obscured by more than two vessel lengths, or 500 m, whichever is less, forward of the bow to 10º on either side irrespective of the vessel's draught and trim;

.2 no blind sector caused by fishing gear or other obstructions outside of the wheelhouse forward of the beam which obstructs the view of the sea surface as seen from the conning position, shall exceed 10º. The total arc of blind sectors shall not exceed 20º. The clear sectors between blind sectors shall be at least 5º. However, in the view described in .1 above each individual blind sector shall not exceed 5º;

.3 the height of the lower edge of the navigation bridge front windows above the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view as described in this paragraph;

.4 the upper edge of the navigation bridge front windows shall allow a forward view of the horizon for a person with a height of eye of 1,800 mm above the bridge deck at the conning position when the vessel is pitching in heavy seas. However, the Administration, being satisfied that a 1,800 mm height of eye is unreasonable and impractical, may reduce the height of eye but not to less than 1,600 mm;

.5 the horizontal field of vision from the conning position shall extend over an arc of not less than 225º, that is from right ahead to not less than 22.5º abaft the beam on either side of the vessel;

.6 from each bridge wing the horizontal field of vision shall extend over an arc of at least 225º, that is from at least 45º on the opposite bow through right ahead and then from right ahead to right astern through 180º on the same side of the vessel;

.7 from the main steering position the horizontal field of vision shall extend over an arc from right ahead to at least 60º on each side of the vessel;

.8 the vessel's side shall be visible from the bridge wing; and

.9 windows shall meet the following requirements:

.9.1 framing between navigation bridge windows shall be kept to a minimum and not be installed immediately forward of any workstation;

.9.2 to help avoid reflections, the bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10º and not more than 25º;

.9.3 polarized and tinted windows shall not be fitted; and

.9.4 a clear view through at least two of the navigation bridge front windows and depending on the bridge configuration, an additional number of clear view windows shall be provided at all times regardless of weather conditions.

2 Existing vessels shall, where practicable, meet the requirements of 1.1 and 1.2. However, structural alterations or additional equipment need not be required.

3 On vessels of unconventional design which, in the opinion of the Administration cannot meet the requirements of this Requirement, arrangements shall be provided to achieve a level of visibility that is as near as practicable to that stated in 1.

4 For vessels below 45 m in length, the Administration shall determine which of the requirements contained in 1 to 3 shall apply, wholly or in part.

6 Pilot transfer arrangements

1 Vessels engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.

2 When a vessel is at sea, similar arrangements to 1 shall be provided for fisheries inspectors.

3 Such transfer arrangements shall comply with the provisions of annex VI in Part B of the IMO/ILO/FAO Code of Safety for fishermen and fishing vessels, 2005.

6 Log Book

On every vessel, the skipper shall maintain and keep updated a log book. Main events regarding navigation, safety of life at sea, security, pollution, communications, and all other incidents or accidents concerning the vessel, its machinery and its fishing activity shall be recorded in the log book.

CHAPTER 11
CREW ACCOMMODATION

1 General

1 Before the construction of a fishing vessel, and before the crew accommodation of an existing fishing vessels is substantially altered or reconstructed, detailed plans of, and information concerning, the accommodation shall be submitted to the Administration, or an entity authorized by the Administration, for approval. Crew accommodation forms an integral part of the procedural requirements for ship safety certification and safe manning, and shall be in accordance with the present requirements.

2 In vessels intended for fishing on the high seas or for distant water fishing in waters of States other than those of the flag State, and carrying a crew of more than 20, consideration shall be given to the provision of separate mess room accommodation for the skipper and officers and, where applicable, observers and scientists.

3 Location, structure and arrangement of crew accommodation spaces and means of access thereto, shall be such as to ensure adequate security, protection against weather and sea and insulation from heat and cold, undue noise, vibration or effluvia from other spaces. In particular, the insulation material to be applied to bulkheads and deckheads of machinery spaces adjacent to crew accommodation shall be of an approved type.

4 Where in view of operational requirements the Administration has permitted sleeping rooms to be placed in the fore part of the vessel, they shall be placed aft of the collision bulkhead and to the extent possible, not below the working deck.

5 Bulkheads and decks between accommodation spaces and fish-holds; machinery spaces; fuel tanks; galleys, engine, deck and other store-rooms; drying rooms, communal wash-places or water-closets, shall be so constructed as to prevent the infiltration of fumes and odours. Direct openings into sleeping rooms from such places shall be avoided wherever reasonable or practicable. That part of bulkheads separating such places from sleeping rooms, and also external bulkheads, shall be gas-tight and, where necessary, shall prevent the passage of water.

6 Where corridors are provided in crew accommodation these shall be as wide as possible but shall not be less than 700 mm and be fitted with handrails on at least one side. Where doors open outwards into a passageway, there shall be sufficient space to pass the door when it is open at a right angle to the passageway.

7 Accommodation spaces shall be adequately insulated to prevent loss of heat, condensation or overheating. Care shall be taken to provide protection from heat effects of steam and/or hot-water service pipes.

8 Fuel oil, sounding and hydraulic oil pipes, high voltage electrical wiring for winch machinery or steam piping, except steam heating systems, shall not be led through accommodation spaces unless such arrangement is approved by the Administration.

9 In the choice of materials used for construction of accommodation spaces, account shall be taken of properties potentially harmful to the health of personnel, or likely to harbour vermin and mould. Surfaces, including decks, of accommodation and furnishings shall be of a kind easily kept clean and hygienic, as well as impervious to damp. Bulkhead and deckhead surfaces, if painted, shall be light in colour and the paint specification shall be to the approval of the Administration. Other surface coverings, such as lime wash, shall not be used.

10 Where the deck covering is of composition material, the connection to the side of the vessel, bulkheads and partitions shall be rounded to avoid crevices.

11 All practical measures shall be taken to protect crew accommodation and furnishings against the admission of insects and other pests.

12 Overhead exposed decks over crew accommodation shall be sheathed with wood or equivalent insulation.

13 The electrical switchboard shall be so arranged that when the shore power connection is made, power would be available for crew accommodation lighting, ventilation systems and where applicable heating and cooking facilities.

14 Access to ordinary exits and emergency exits shall be marked with direction indicators. Exits shall be marked in a conspicuous manner above or beside the door.

2 Lighting, heating and ventilation

1 All crew accommodation spaces shall be adequately lighted, as far as possible, by natural lighting. Such spaces shall also be equipped with adequate artificial light. Artificial light shall be in accordance with accepted standards of visual comfort in living spaces.

2 The minimum standards for natural lighting in crew accommodation shall be such as to permit a person with normal vision to read an ordinary newspaper on a clear day.

3 If there are not two independent sources of electricity for lighting, additional lighting shall be provided by properly constructed lamps or lighting apparatus for emergency use.

4 An adequate reading light shall be provided for every berth in addition to the normal lighting of the cabin.

5 A permanent night light shall, in addition to the normal lighting, be provided in sleeping rooms during the night. Mess rooms and alleyways, that contain emergency escapes facilities from the crew accommodation, shall also be provided with a permanent night light during the night.

6 Methods of lighting shall not endanger the health or safety of the crew or the safety of the vessel.

7 Adequate heating facilities in accommodation spaces shall be provided as required by climatic conditions. Heating facilities shall be capable of maintaining a satisfactory air temperature in crew accommodation under normal conditions of service of a fishing vessel and as prescribed by the Administration. The accommodation shall be capable of being heated sufficiently to maintain a minimum temperature of +22°C in all day rooms at an outside temperature of -15°C.

8 Facilities for heating shall be designed so as not to endanger health or safety of the crew or the safety of the vessel.

9 Heating by means of open fires is prohibited.

10 Accommodation spaces shall be adequately ventilated at all times when the crew is expected to remain on board. Ventilation systems shall be capable of control so as to maintain the air in a satisfactory condition and to ensure a sufficiency of air movement in all conditions of weather and climate. The ventilation of galley, sanitary and hospital spaces shall be to the open-air and unless fitted with a mechanical ventilation system approved by the Administration, be independent from that for other crew accommodation.

11 Accommodation spaces of vessels regularly engaged on voyages in the tropics and in similar climatic conditions, except in deckhouses with satisfactory natural ventilation, shall be equipped with mechanical ventilation and, if necessary, with additional electric fans or air conditioning, in particular in mess rooms. When necessary to ensure satisfactory ventilation, vessels engaged elsewhere shall be equipped either with mechanical means of ventilation or with electric fans.

12 Vessels fitted with air conditioning shall carry a suitable gas detector.

13 Drying rooms or lockers for working clothes and oilskin lockers shall have adequate ventilation that is independent of other spaces. The exhaust from such spaces shall be well clear of the air intakes of the ventilation systems for other spaces.

3 Sleeping rooms

1 Sleeping rooms shall be so planned and equipped as to ensure reasonable comfort for the occupants and to facilitate tidiness. The clear headroom shall, whenever possible, be not less than 2 m. There shall be no access to the accommodation from the fish room.

2 Wherever reasonable and practical, the floor area of sleeping rooms per person accommodated therein, excluding space occupied by berths and lockers, shall not be less than:

.1 1 m² in vessels of 24 m but below 45 m in length; and

.2 1.5 m² in vessels of 45 m in length or over.

3 Wherever reasonable and practicable with respect to the size, type or intended service of a vessel, the number of persons allowed to occupy each sleeping room shall not be more than four persons in vessels of 37 m in length and over and six persons in vessels of less than 37 m in length. Sleeping rooms for officers shall be for one person wherever possible and in no case shall the sleeping room contain more than two berths.

4 The maximum number of persons to be accommodated in any sleeping room shall be clearly and indelibly marked in the room where it could be conveniently seen. Where appropriate, a notice shall also be posted in a language understood by the majority of the occupants.

5 Each member of the crew shall be provided with an individual berth, the minimum inside dimensions of which shall, wherever practicable, be 1.9 m by 680 mm.

6 Berths shall not be placed side by side in such a way that access to one berth can be obtained only over another. Berths shall not be arranged in tiers of more than two. The lower berth in a double tier shall not be less than 300 mm above the deck; the upper berth shall be placed approximately midway between the bottom of the lower berth and the lower side of the deck head beams.

7 Where the upper berth in a tier overlaps a lower berth, the underside of the upper berth shall be fitted with a dust proof bottom of wood, canvas or other material.

8 The framework and the lee-board, if any, of a berth shall be of approved material, hard, smooth and not likely to corrode or to harbour vermin.

9 If tubular frames are used for the construction of berths, they shall be completely sealed and without perforations that would give access to vermin.

10 Suitable bedding shall be provided for the crew. Mattresses shall not be of a type that is liable to develop toxic fumes in case of fire or harbour vermin. Mattresses shall be provided with a cover of fire retardant material.

11 Wherever reasonable and practicable with respect to the size, type or intended service of a vessel, the furnishings of sleeping rooms shall include both a fitted cupboard preferably with an integral lock and a drawer for each occupant. Sleeping rooms shall also be fitted with a satisfactory table or desk, adequate and proper seating, curtains for sidelights, a mirror, cabinets for toilet requisites, a book rack and coat hooks.

12 Where fishers are carried on board for the sole purpose of operating from small boats carried by the fishing vessel and are not part of the crew, suitable sleeping accommodation, sanitary and mess-room facilities shall be provided. Due to the different nature and frequency of their operations to those of the crew, such facilities shall preferably be separate to those provided for the crew normally assigned watchkeeping duties.

4 Mess rooms

1 Mess room accommodation separate from sleeping quarters shall be provided in all vessels regularly carrying a crew of more than ten persons. Wherever reasonable and practicable, it shall be provided also in vessels carrying a smaller crew.

2 The mess room shall be as close as practicable to the galley.

3 The dimensions and equipment of each mess room shall be sufficient for the number of persons likely to use it at any one time.

4 The furnishings of mess rooms shall include tables and approved seats sufficient for the number of persons likely to use them at any one time. The tops of tables and seats shall be free of sharp edges and shall be of damp resisting material without cracks and easily kept clean.

5 Where pantries are not accessible from mess rooms, adequate lockers for mess utensils and proper facilities for washing shall be provided.

6 Mess rooms shall be planned, furnished and equipped to provide appropriate facilities for recreation.

7 Whenever possible, a separate recreation room shall be provided for the crew.

5 Sanitary facilities

1 Sufficient sanitary facilities, including wash-basins, shower-baths and water- closets, shall be provided to the satisfaction of the Administration, having due regard to the intended service of the vessel. Wherever practicable, such facilities shall be provided as follows:

.1 one shower-bath for every eight persons or less;

.2 one water-closet or suitable alternative for every eight person or less; and

.3 one wash-basin for every six persons or less.

Provided that when the number of persons exceeds an even multiple of the specified number by less than one half of the specified number, this surplus may be ignored for the purpose of this paragraph.

2 Where there is more than one water-closet in a compartment, they shall be adequately screened to ensure privacy.

3 In general, water-closets shall be situated convenient to, but separate from, sleeping rooms, mess rooms and washrooms.

4 In cases where a water-closet is provided with direct access from sleeping places that are intended for not more than two persons, the access shall be so constructed as to provide a reasonable seal when closed. Such water-closets may also house washing facilities and shall be provided with a separate means of ventilation and shall not ventilate to or through the adjacent sleeping space.

5 Cold fresh water and hot fresh water or means of heating fresh water shall be available in all wash places.

6 The deck area of wash places shall have a covering of durable material, easily cleaned, impervious to damp and properly drained. The deck covering shall be carried up the sides of the compartment to a height of not less than 0.2 m and be adequately sealed at all joints to prevent the ingress of water and damp.

7 The bulkheads shall be of steel or other approved material and shall be watertight to a height of at least 0.25 m above the deck to allow for effective sealing of the deck covering.

8 All sanitary equipment and systems shall be of a design, construction and size approved by the Administration. In particular, showers shall have anti-scalding valves of an approved type, sufficient drainage shall be provided, and soil and waste discharge pipes shall be of adequate dimensions and constructed so as to facilitate cleaning. International standards concerning shipboard sanitary facilities contained in the WHO Guide to Ship Sanitation, 1967, as amended, may serve as guidance.

9 Soil and waste discharge pipes shall not pass through fresh water or drinking water tanks or, where practicable, provision stores. Neither shall they, where practicable, pass overhead in mess rooms or sleeping accommodation. Such pipes shall be fitted with anti-syphon closures.

10 Facilities for washing and drying clothes shall be provided on a scale appropriate to the number of the crew and the duration of intended voyages. These facilities shall include an adequate supply of cold fresh water and hot fresh water or means of heating fresh water. Wherever reasonable and practicable, separate laundry accommodation shall be provided.

6 Potable water facilities

Filling, storage and distribution arrangements for potable water shall be designed to preclude any possibility of water contamination or overheating. Tanks shall be designed to allow internal cleaning. In this connection, the relevant international standards laid down in the WHO Guide to Ship Sanitation, 1967, as amended, shall be followed.

7 Provision stores

Provision store-rooms of adequate capacity shall be provided which can be kept cool, dry and well ventilated in order to avoid deterioration of the stores. Where necessary, taking into consideration the area of operation and the duration of the voyage, refrigerators or other low-temperature storage space shall be provided. It shall be possible to keep a temperature in refrigerating rooms or similar rooms of between -1^{o}C and +4^{o}C in all climatic conditions.

Vessels whose area of operation requires foodstuffs to be frozen during storage shall be fitted with chest freezers, upright freezers or freezing rooms. It shall be possible to keep a temperature of -25°C or lower in all climatic conditions and store fish separate from other foodstuffs. The temperature in refrigerating and freezing rooms shall be capable of being read from the outside. Doors to refrigerating and freezing rooms shall be capable of being opened from either side. An alarm system shall be arranged from the refrigerating and freezing room to the galley or other appropriate location if such rooms are large enough for personnel to enter them.

8 Cooking facilities

1 Having regard to the intended service of the vessel, satisfactory cooking appliances and equipment shall be provided and shall, wherever practicable, be fitted in a separate galley.

2 Galleys shall be of adequate dimensions for the purpose and have sufficient storage space and satisfactory drainage.

3 The galley shall be provided with cooking utensils, the necessary number of cupboards, shelves, sinks and dish racks of rustproof material and with satisfactory drainage. Drinking water shall be supplied to the galley by means of pipes. Where it is supplied under pressure, the system shall be protected against backflow. Where hot water is not supplied to the galley, a water heater shall be fitted.

4 The galley shall be fitted with suitable facilities for the preparation of hot drinks for the crew at all times.

5 Cooking appliances shall be fitted with fail-safe devices in the event of failure of the power source or fuel. Supplies of fuel in the form of gas or oil shall not be stored in the galley.

6 A domestic refrigerator of sufficient capacity for the number of persons using each mess room. Facilities shall be provided for hot beverages, and cool water shall also be provided for the benefit of the crew.

9 Hospital accommodation

A sick bay or equivalent together with suitable sanitary facilities shall be provided in vessels of 45 m in length and over intended for fishing operations in sea areas beyond 50 nautical miles from a place of shelter. In vessels of 100 m in length or over the sick bay shall be equipped with a detachable and portable swivel bed and shall be designed to facilitate removal of a patient in the portable bed.

CHAPTER 12
MANNING, TRAINING AND COMPETENCE

1 Application

1 The provisions of the present chapter shall apply to all personnel serving on board new and existing ships not authorized to navigate more than 20 miles from the shore.

2 The provisions of the International Convention on Standards of training, certification and watchkeeping for fishing vessel personnel, 1995, shall apply to new and existing ships.

2 Manning

1 The Administration shall ensure that vessels are sufficiently and safely manned with a crew necessary for the safe navigation and operation of the vessel and under the control of a competent skipper19. When deciding on the manning the Administration shall take into account:

.1 seasonal weather conditions;

.2 sea states in which the vessel could operate;

.3 type of vessel;

.4 the range and risk of the fishing operation;

.5 length of time the vessel is at sea;

.6 distance from shore;

.7 training and experience of the fishermen; and

.8 the need to minimize fatigue.

3 Skippers' standard of competence

1 The skipper shall be sufficiently trained and experienced to keep the vessel safe and well managed at all times. This includes:

.1 operating and maintaining machinery and systems;

.2 handling emergencies and using communications to seek help;

.3 first aid;

.4 manoeuvring a vessel, at sea, in port and during fishing operations;

.5 knowledge of navigation;

.6 weather conditions and forecasting;

.7 knowledge of stability;

.8 the use of signals;

.9 application of the collision requirements;

.10 understanding and minimizing the risks of fishing operations;

.11 knowledge of security; and

.12 knowledge of pollution prevention.

4 Certification of skippers

1 The skipper shall be certificated by the Administration.

2 Every candidate for certification shall satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing, and have approved seagoing service of not less than 12 months on fishing vessels.

3 The certification shall be granted after having passed a written and/or oral and /or practical examination including the items listed in paragraph 3.

5 Crew training

Each of the crew shall be trained in:

.1 the use of fire extinguishers, lifejackets and personal flotation devices;

.2 work place safety; including understanding the dangers associated with fatigue and the consumption of alcohol and drugs;

.3 safe handling of the fishing gear;

.4 safe operation of deck equipment;

.5 basic pre-sea safety training and familiarization20;

.6 security;

.6 pollution prevention; and

.7 prevention of onboard accidents applying the principles of risk assessment.

6 Watchkeeping

1 The skipper shall ensure that watchkeeping arrangements are adequate for maintaining a safe and permanent navigational watch, in particular for avoiding collision and stranding.

2 The composition of the crew shall at all times be adequate and appropriate to the foreseeable circumstances and conditions of the intended activities for maintaining a proper look-out.

3 The watch system shall be such that the efficiency of watchkeeping personnel is not impaired by fatigue.

CHAPTER 13
PREVENTION OF POLLUTION

1 Ships of 400 gross tonnage and upwards, engaged in international voyages and subject to the present requirements, shall be issued the following certificates according to the relevant provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978, hereinafter referred to as MARPOL:

.1 an International Oil Pollution Prevention Certificate,

.2 an International Air Pollution Prevention Certificate,

2 Ships of less than 400 gross tonnage, engaged in international voyages and certified to carry more than 15 persons shall be issued an International Sewage pollution Prevention Certificate.

3 Every ship subject to certification under paragraphs 1 and 2 complies with all the relevant requirements of the relevant Annex to MARPOL.

2 Discharge at sea

1 Any discharge into the sea of oil or oily mixtures from ships shall be prohibited, except when the following provisions are satisfied :

.1 the ship is proceeding en route;

.2 the ship has in operation equipment of a design approved by the Administration that ensures that the oil content of the effluent without dilution does not exceed 15 parts per million.

2 Disposal of garbage at sea is prohibited, except food waste at a distance of more than 12 nautical miles from the nearest land.

3 Retention on board

1 Ships shall be provided with a tank or tanks of adequate capacity, having regard to the type of machinery and length of voyage, to receive the oil residues (sludge) which cannot be dealt with otherwise in accordance with the requirements of paragraph 2.1, such as those resulting from the purification of fuel and lubricating oils and oil leakages in the machinery spaces.

2 The crew and other persons on board shall be notified, by placards or another information mode, of the disposal prohibition defined in paragraph 2.2. They shall be informed on the locations where garbage they could detain or generate may be stored on board.

4 Disposal ashore and record keeping

1 Substances or garbage that are retained on board shall be disposed of ashore in accordance with the relevant national or local requirements.

2 Record shall be kept on the ship’s log book of any discharge of oil or oily substances:

.1 either at sea in accordance with paragraph 2.1, with indication of the amount discharged and conditions,

.2 or in a shore reception facility, the receipt shall be kept for a minimum duration of 3 months.

CHAPTER 14
SAFETY MANAGEMENT

1 Voluntary application of the International Safety Management Code

The provisions of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management - ISM Code), adopted by the IMO in resolution A.741(18), as amended, may be applied voluntarily to vessels covered by the present requirements.

2 Voluntary application of the Safety Assessment and Management System21

The provisions of the Safety Assessment and Management System as described in Appendix 1, Part A, of the Code of safety for fishermen and fishing vessels, 2005, may also be applied voluntarily to vessels covered by the present requirements.

CHAPTER 15
SECURITY OF VESSEL

1 Application

The requirements of the present chapter shall apply to new and existing ships, taking into account the security environment and the risk area related to the operating area and the security risk that may be encountered during the intended voyage, as evaluated by the Administration.

2 Vessel security

Searching

1 Vessels shall be searched after having been left unattended to ensure that nothing has been placed aboard while the vessel was unattended and for the purpose of concealing trespassing persons and articles placed on board for illegal purposes. To the extent possible, checks shall include all spaces accessible to non-authorized persons while the vessel was unattended, e.g., any crew areas, holds, under-water hull, if concern prevails and areas that could conceal persons or articles that may be used for illegal purposes.

Securing

2 With due regard to the need to facilitate escape in the event of an emergency, where possible external doors, hatches and storage areas shall be kept locked and windows secured while the ship is left unattended. If the vessel is left unattended for a long period of time such as overnight, it is recommended that the engine is disabled to prevent theft/unauthorized use.

Preventing unauthorized access to vessels

3 Measures preventing unauthorized access to vessels shall be implemented and maintained. Such measures may be:

.1 over-the-side lighting which gives an even distribution of light on the whole hull and waterline;

.2 keeping a good watch from the deck;

.3 challenging all approaching boats; if unidentified, they shall, where possible, be prevented from coming alongside; and

.4 all visitors and contractors shall report to the skipper of the vessel, or other responsible person to notify them of their arrival.

3 Contingency measures for security alerts

1 Contingency measures shall be in place for dealing with emergency navigational and health and safety alerts on board vessels. These plans may be adapted to include procedures for security alerts and incidents.

2 If a suspicious device or package is found while a vessel is at sea, the master shall take into account:

.1 the size and location of the device;

.2 the credibility of the threat;

.3 the vessel's location and the time it will take for security services and other assistance to arrive;

.4 the need to keep everyone well clear of the suspect device; and

.5 the need for all on board to keep clear of all doors, trunks and hatches leading from the space containing the device to avoid possible blast injuries.

4 Reporting security incidents

1 Procedures and processes for reporting and recording security incidents shall be implemented. The skipper shall be provided with contact information for authorities responsible for emergency response, the national response centre(s) (if appropriate) and any other authorities that may need to be notified.

2 Reports of security incidents on board a vessel shall be reported to the skipper or the person designated by him.

3 In the event of a security incident occurring while the vessel is at sea the skipper, in addition to activating an appropriate response, shall alert the nearest coastal State or authorities and/or vessels in vicinity and provide details of the incident.

5 Training

1 The skipper shall be made aware of basic security requirements contained in chapter 11-2 of the SOLAS Convention, as amended, as well as in the International Code for the Security of Ships and of Port Facilities (ISPS Code), adopted by the IMO in resolution A.924(22), as amended.

2 Every new members of the crew, when embarking on board the vessel for the first time, shall be briefed on security risks and how to report any suspicious situation he may encounter.

APPENDIX

(Name of Country)

MINISTRY OF THE MERCHANT MARINE

SAFETY CERTIFICATE FOR FISHING VESSEL
(This Certificate shall be supplemented by a Record of Equipment)

Issued under the provisions of the Safety Regulations for Fishing Vessel of more than 24 m. in length.

By : Mr/Mrs/Ms.....

Name of vessel	Distinctive number or letters	Port of registry	Length	Type

Fishing Vessel : New / Existing

Gross tonnage.....
Power of main propulsion engine (kW) .....
Limits of navigation authorised.....
Areas in which the vessel is certified to operate (under GMDSS rules) .....

Name and address of shipowner .....
.....
.....

Date on which keel was laid or vessel was at a similar stage of construction or, where applicable, date on which work for an alteration or modification of a major character was commenced :
.....

Maximum permissible operating draught:.....
Location of the Maximum permissible operating draught measured from the working deck (freeboard):.....

Possible exemptions granted, by.....Date.....
1 - .....
2 - .....

THIS IS TO CERTIFY :

Name of vessel ..... Registration number .....

1 That the vessel has been surveyed in accordance with the requirements of the Regulation

2 That the survey showed that :

2.1 the condition of the structure, machinery and equipment was satisfactory and the vessel complied with the relevant requirements of the Regulations ;

2.2 the last inspection of the outside of the vessel's bottom took place on ..... .(*date*) ;

2.3 the vessel complied with the requirements of the Regulations as regards fire safety systems and appliances and fire control plans ;

2.4 the life-saving appliances and the equipment of the liferafts boats were provided in accordance with the requirements of the Regulations ;

2.5 the vessel complied with the requirements of the Regulations as regards radio installations;

2.6 the vessel complied with the requirements of the Regulations as regards shipborne navigational equipment and nautical publications ;

2.7 the vessel was provided with lights, shapes, means of making sound signals and distress signals in accordance with the requirements of the Regulations and the International Regulations for Preventing Collisions at Sea in force ; and

2.8 in all other respects the vessels complied with the relevant requirements of the Regulations.

3 That the vessel described in the present document shall be considered as being provided with adequate personnel for the purposes of safety in accordance with the Regulations if, when it puts to sea, it has on board at least the number of persons with the ranks/capacities specified in the table(s) below.

Rank/capacity	Certificate	Number of personnel

Name of vessel ..... Registration number .....

4 That the vessel has been subject to a voluntary audit on ..... *(date)* and that it satisfies the requirements of the International Code for the Safe Management of Ships and Prevention of Pollution (ISM Code), after verification that the certificate of conformity of the company applies to this type of vessel, or, on a provisional basis

This certificate is valid until .....

subject to the annual surveys and inspection of the outside of the vessel's bottom in accordance with the Regulations .

Issued at .....
(Place of issue of certificate)

_____ _____
(Date of issue) *(Signature of authorized official issuing the certificate)*
(Seal or stamp of the issuing authority, as appropriate)

Name of vessel	Registration number

Endorsed in confirmation of the validity of this Certificate after satisfactory annual Survey.

At ....., on 20

Signature and official seal

Endorsed in confirmation of the validity of this Certificate after satisfactory annual Survey.

At ....., on 20

Signature and official seal

Endorsed in confirmation of the validity of this Certificate after satisfactory annual Survey.

At ....., on 20

Signature and official seal

Endorsed in confirmation of the validity of this Certificate after satisfactory annual Survey.

At ....., on 20

Signature and official seal

Name of vessel ..... Registration number .....

Record of equipment for the Fishing Vessel Safety Certificate

(This Record shall be permanently attached to the Safety Certificate for Fishing Vessel issued at..... on.....)

1 *Particulars of vessel*

Name of vessel .....
Registration Number or distinctive letters .....

2 *Details of life-saving appliances*

1 Total number of persons for which life-saving appliances are provided		
	Port side	Starboard side
2.1 Total number of lifebrafts	.....	.....
2.2 Total number of persons accommodated by them	.....	.....
	.....	.....
2.3 Other lifeboats	.....	
3 Number of lifebuoys		
4 Number of lifejackets		
5 Immersion suits :		
5.1 Total number		
5.2 Number of suits complying with the requirements for lifejackets		
6 Number of thermal protective aids		
7 Radio installations used in life-saving appliances :		
7.1 Number of radar transponders		
7.2 Number of two-way VHF radiotelephone apparatus		

3 *Details of radio facilities*

Item	Actual provision
1 Primary systems	
1.1 VHF radio installation:	.....
1.1.1 DSC encoder	.....
1.1.2 DSC watch receiver	.....
1.1.3 Radiotelephony	
1.2 MF radio installation:	.....

1.2.1 DSC encoder	.....
1.2.2 DSC watch receiver	.....
1.2.3 Radiotelephony	
1.3 MF/HF radio installation:	.....
1.3.1 DSC encoder	.....
1.3.2 DSC watch receiver	.....
1.3.3 Radiotelephony	.....
1.4 INMARSAT earth ship station	.....
2 Secondary means of alerting	.....
3 Facilities for reception of maritime safety information :	
3.1 NAVTEX receiver	.....
3.2 EGC receiver	.....
3.3 HF direct-printing radiotelegraph receiver	.....
4 EPIRB satellite	
4.1 COSPAS-SARSAT	
4.2 INMARSAT	.....
	.....
5 VHF EPIRB	.....
6 Ship's radar transponder	.....

5 Other relevant documents

Stability information
Charts, list of lights, sailing directions
Log book

THIS IS TO CERTIFY that this Record is correct in all respects .

Issued at …….....
(Place of issue of the Record)

....
(Date of issue) (Signature of duly authorized official issuing the Record)
(Seal or stamp of the issuing authority, as appropriate)

_____

ANNEX 1

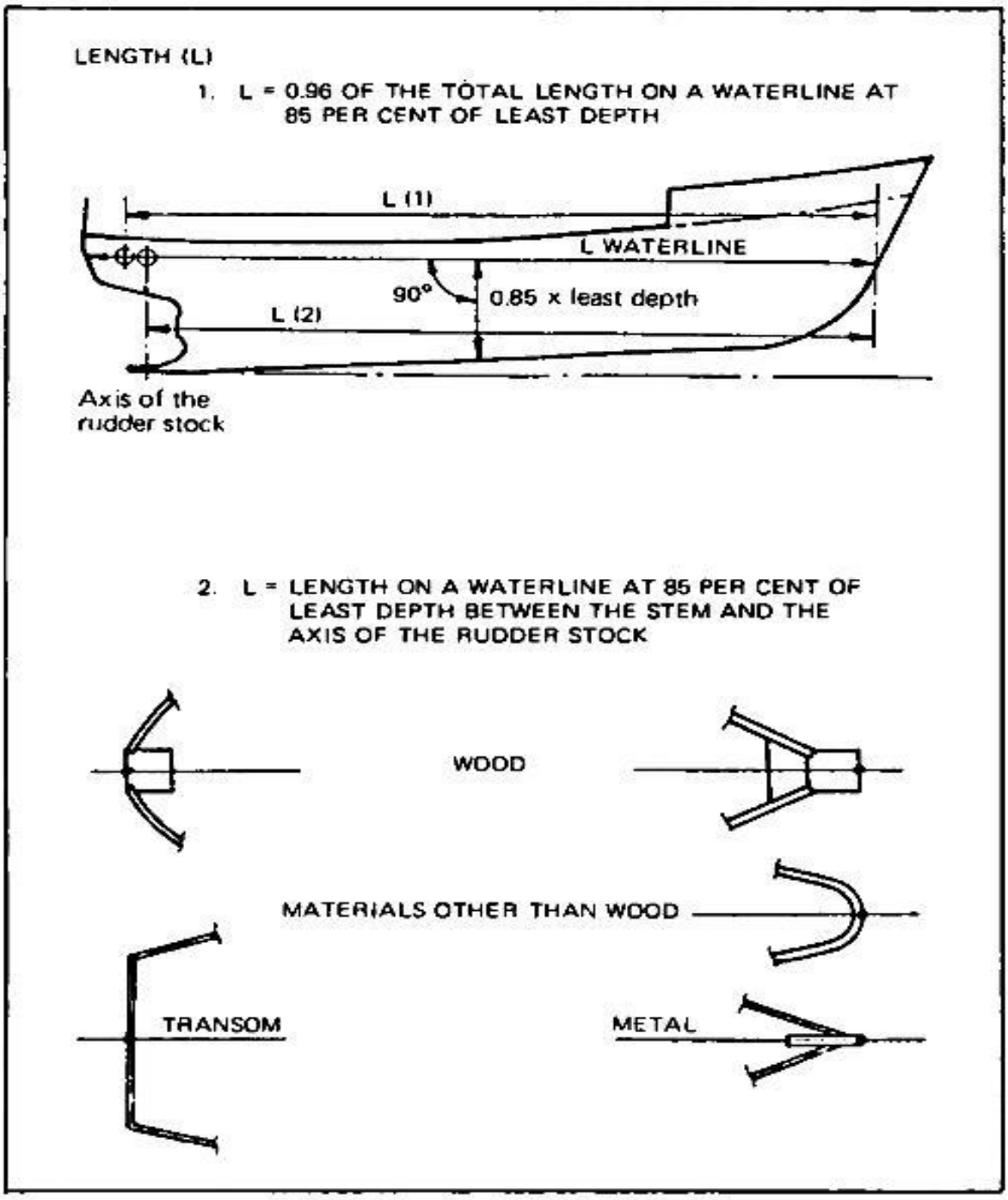

Figure 1

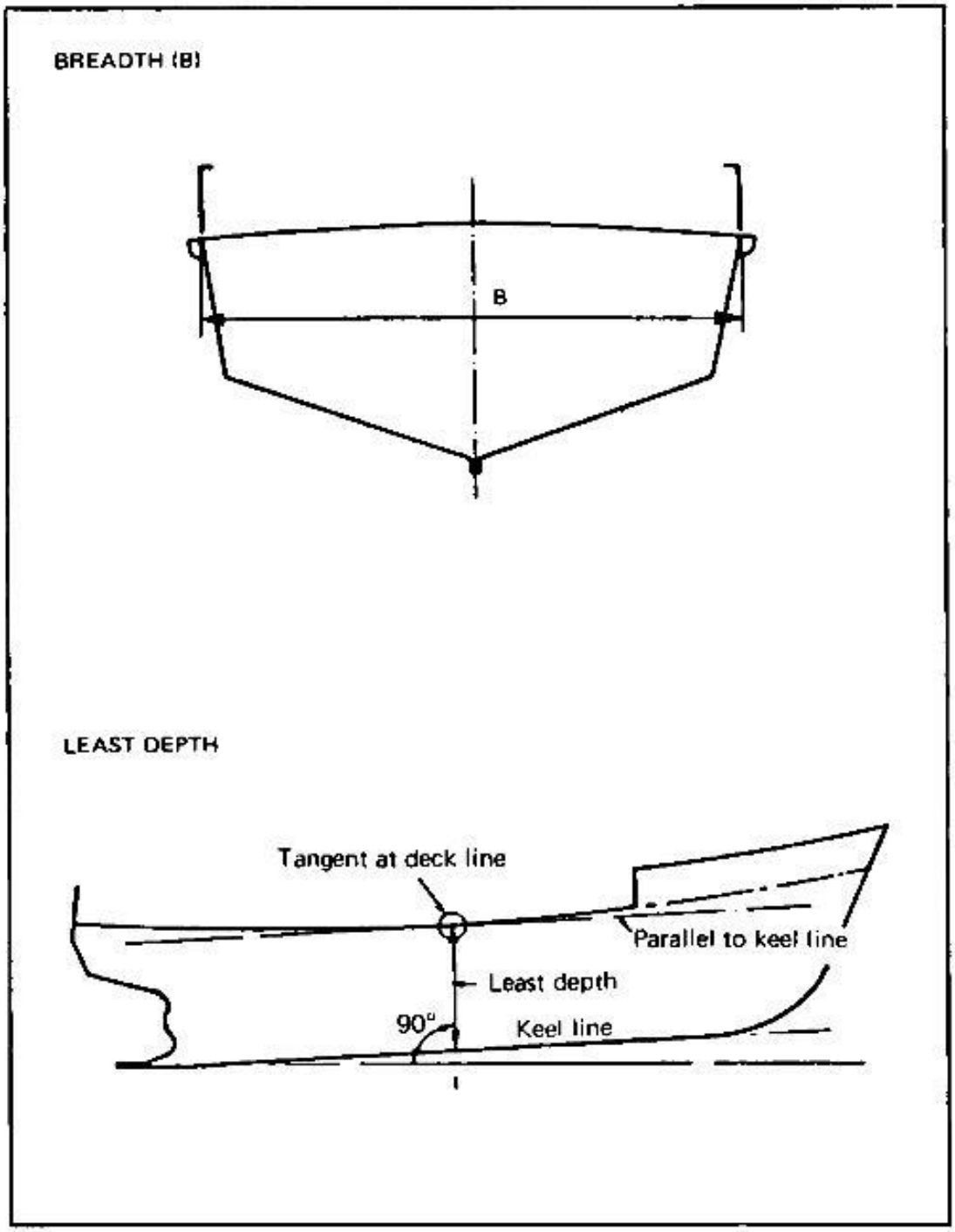
BREADTH (B)
B
LEAST DEPTH
Tangent at deck line
Parallel to keel line
Least depth
90°
Keel line

Figure 2

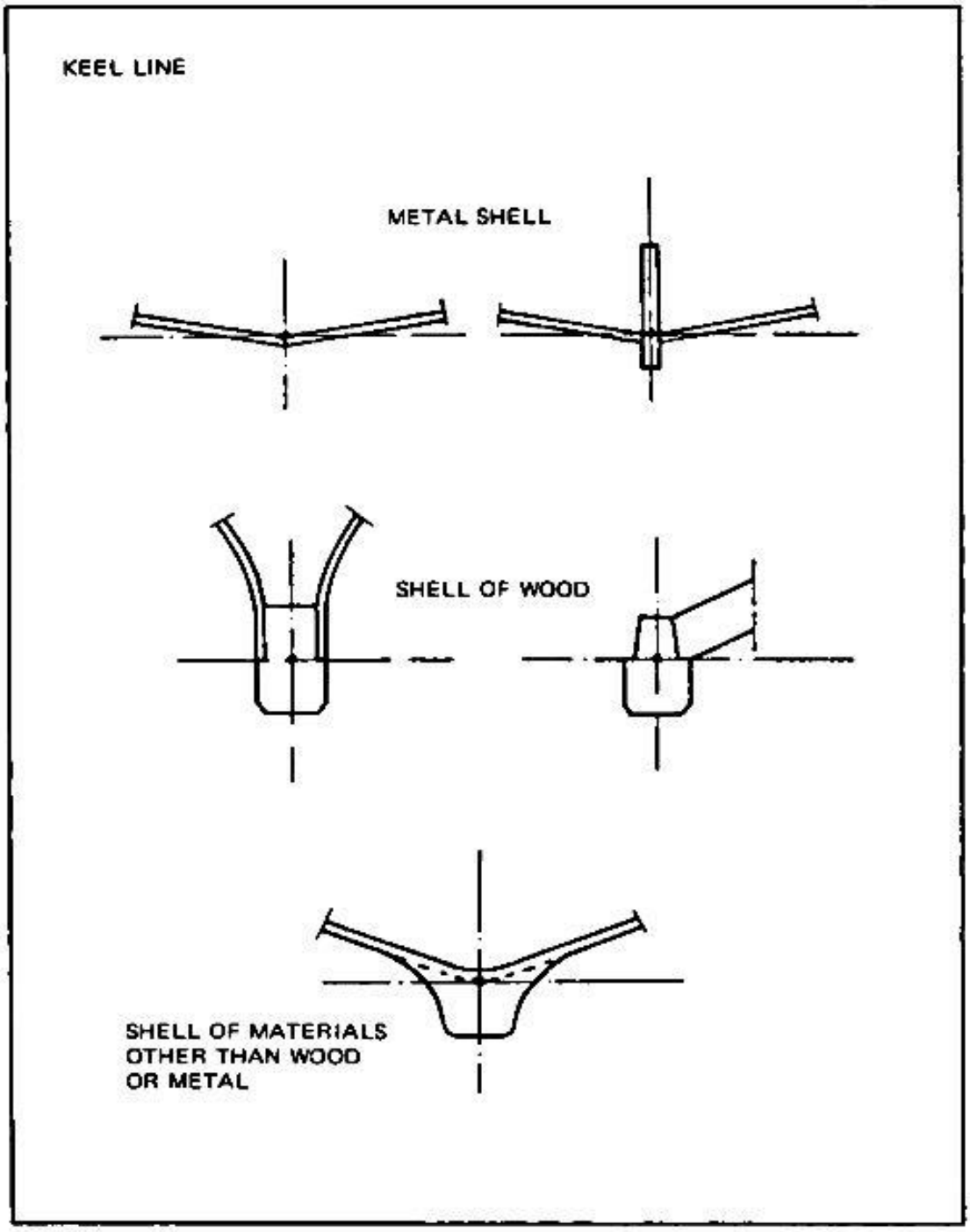
KEEL LINE
METAL SHELL
SHELL OF WOOD
SHELL OF MATERIALS
OTHER THAN WOOD
OR METAL

Figure 3

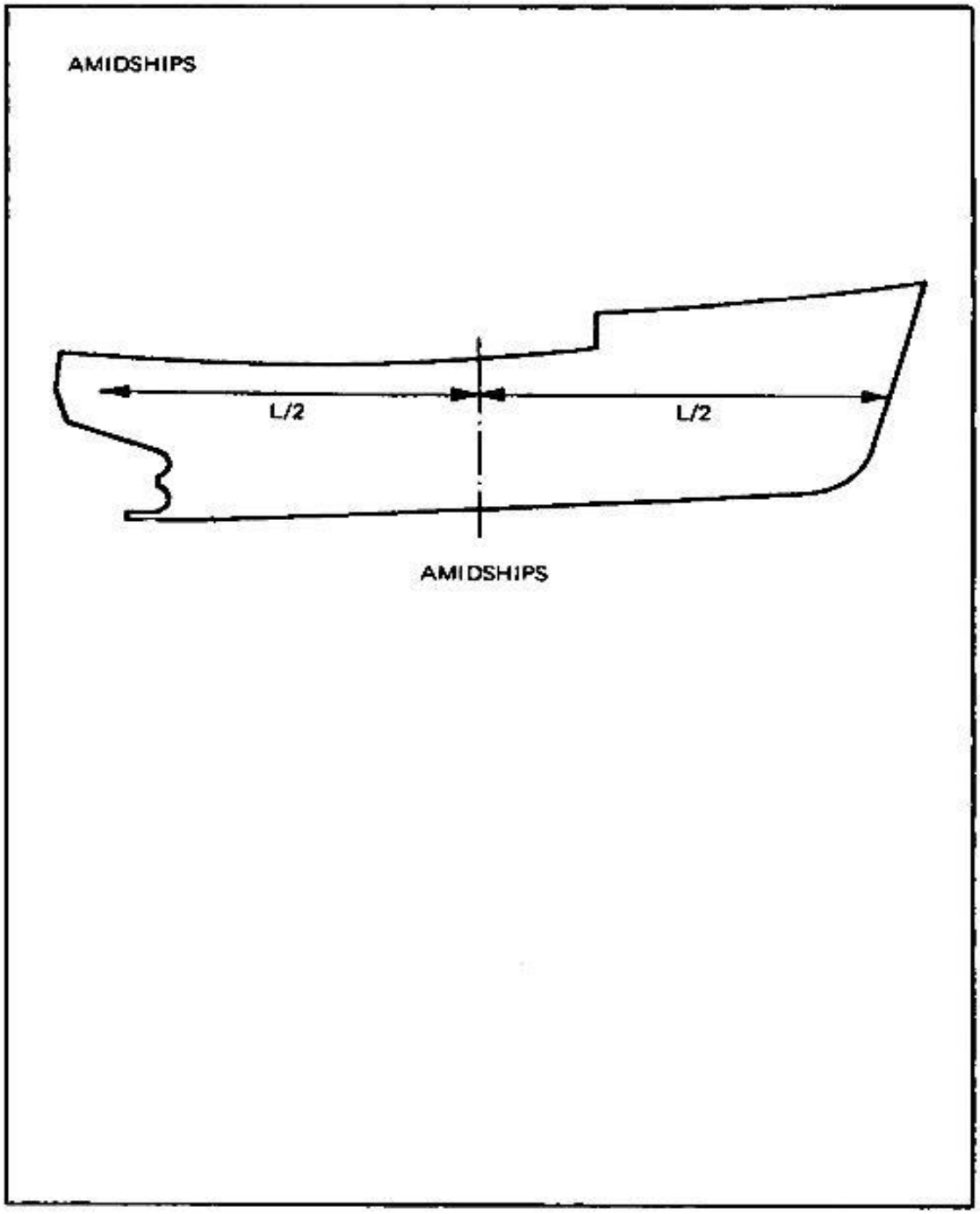

Figure 4

ANNEX 2

RECOMMENDED STANDARDS FOR ANCHORING AND MOORING EQUIPMENT

1 The characteristics of anchors, chain, wires, towlines and mooring lines shall be determined in accordance with the attached table, based on an equipment number "EN" as follows.

$$EN = \Delta^{\frac{2}{3}} + 2B(a + \sum h_j) + 0.1A$$

where:

Δ moulded displacement, in tonnes, to the maximum design waterline;

B breadth, in m, as defined in 1.2.1.9;

a distance, in m, from the maximum design waterline to the upper edge of the uppermost complete deck at side amidships;

hj height, in m, on the centreline of each tier of deckhouses having a breadth greater than B/4. For the lowest tier hj is to be measured at centreline from the upper deck or from a notional deck line where there is a local discontinuity in the upper deck. When calculating hj sheer and trim should be ignored;

A area, in m^2, in profile view of the hull, within L as defined in 1.2.1.7 and of superstructures and deckhouses above the maximum design waterline having a width greater than B/4. Screens and bulwarks more than 1.5 m in height should be regarded as parts of deckhouses when determining hj and A.

Anchors and chains

2 Vessels should be fitted with at least two anchors which should be located at the bow.

3 The weight of each anchor should be in accordance with the table given in this annex.

4 High holding power anchors of a design approved by the competent authority may be used as bower anchors. The weight of each such anchor may be 75% of the table weight given in this annex.

5 The competent authority may require increased anchor equipment for vessels fishing in very rough waters and/or may permit reduction in the equipment for vessels operating in sheltered waters.

6 Anchors with a weight of and above 150 kg should be fitted in hawse pipes, skids or a similar arrangement that is suitable for the quick and safe operation in dropping and hoisting the anchors. If the weight of each of the anchors is below 300 kg, it may be accepted that only one of the anchors need be fitted in a hawse pipe or skid. Anchors should also be secured in the stowed position by means of a locking or lashing device.

7 In general, anchors should be fitted with anchor chains. The length and dimension of each anchor chain should be in accordance with the table given in this annex.

8 The chain of one anchor may be replaced with anchor wire of equal strength, provided a chain meeting the requirements given in the table to this annex is maintained for the second one.

9 Where anchor wires are used as a substitute for anchor chains, their length should be equal to 1.5 times the corresponding tabular length of chain. In addition, a chain of not less than 12.5 m in length and of the same specifications, as set out in the table to this annex, should be provided between anchor and anchor wire.

Anchor handling

10 Fishing vessels should be fitted with a windlass. The windlass should be fitted with a messenger wheel and/or drum for each anchor and means for the release of each messenger wheel or drum.

11 It should not be possible to carry the chains forward to the hawse pipe, skid or similar arrangement without the chain passing over the messenger wheels. When anchor wire is used, it should pass over a roller adjacent to the hawse pipe to avoid chafing.

12 The windlass, its support and its brakes should be capable of absorbing a static tension of at least 45% of the breaking strength of the anchor chain or anchor wire without the occurrence of any lasting deformations and without the brake losing its hold. Furthermore, a chain stopper or wire nipper should be fitted between the windlass and the hawse pipe or similar for each anchor chain or anchor wire capable of holding the vessel while at anchor. If chain stoppers or wire nippers are not fitted, the windlass, its support and its brake should be capable of absorbing a static tension of at least 80% of the breaking strength of the anchor chain or anchor wire. The chain stopper or wire nipper and their supports should be capable of absorbing a static tension of at least 80% of the breaking strength of the anchor chain/wire without the occurrence of any lasting deformations and without the chain stopper or wire nipper losing its hold.

13 If the trawl winch is fitted with messenger wheels, etc. and meets the requirements set out in paragraphs 10, 11 and 12, such a winch may be used as a windlass.

14 If a vessel has lost its anchors and it is not immediately possible to re-acquire them, the competent authority, after having assessed the conditions applying to the vessel, as given in paragraph 5, may permit otter boards/trawl doors with a least the same weight for anchors given in the table to this annex to be used for a limited period of time.

Towing lines

15 Fishing Vessels should be provided with at least one tow line with a length and breaking strength in accordance with the table given in this annex. It should be appropriately located so that it is possible to make it ready for use at sea. The tow line may be replaced by one of the fishing vessel's trawl warps if this has at least a similar length and breaking strength. If warp is used, a length of rope of at least 12.5 m, with a minimum breaking strength as given in the table for the tow line, should also be provided and attached to the warp.

Mooring equipment

16 Vessels should be provided with suitable cleats and bollards as well as hawseholes in order to moor the vessel securely. The number of bollards, etc. should be determined in each individual case, dependent on the size and deck arrangement of the vessel. At least one bollard should be fitted forward and at least two abaft of amidships. Cleats and bollards should be of such a size that it is possible to accommodate at least four turns of the mooring lines or tow line below the horns of the cleat or the upper protruding edge of the bollard. The area where cleats and bollards are to be fastened should be securely reinforced.

17 The vessel should be provided with at least three mooring lines, each of a length and breaking strength in accordance with the table given in this annex.

TABLE

Equipment number		Stockless bower anchors		Stud link chain cables for bower anchors		Towline		Mooring lines	
Not exceeding	Number	Weight per anchor (kg)	Total length (m)	Diameter (mm) Mild steel	Diameter (mm) Special quality steel	Minimum length of each line (m)	Minimum breaking strength (kN)	Minimum length of each line (m)	Minimum breaking strength (kN)
60	2	120	192.5	12.5	-	180	98	60	34
70	2	140	192.5	12.5	-	180	98	80	34
80	2	160	220	14	12.5	180	98	100	37
90	2	180	220	14	12.5	180	98	100	37
100	2	210	220	16	14	180	98	110	39
110	2	240	220	16	14	180	98	110	39
120	2	270	247.5	17.5	16	180	98	110	44
130	2	300	247.5	17.5	16	180	98	110	44
140	2	340	275	19	17.5	180	98	120	49
150	2	390	275	19	17.5	180	98	120	49
175	2	480	275	22	19	180	98	120	54
205	2	570	302.5	24	20.5	180	112	120	59
240	2	660	302.5	26	22	180	129	120	64
280	2	780	330	28	24	180	150	120	69
320	2	900	357.5	30	26	180	174	140	74
360	2	1020	357.5	32	28	180	207	140	78
400	2	1140	385	34	30	180	224	140	88
450	2	1290	385	36	32	180	250	140	98
500	2	1440	412.5	38	34	180	277	140	108
550	2	1590	412.5	40	34	190	306	160	123
600	2	1740	440	42	36	190	338	160	128
660	2	1920	440	44	38	190	371	160	132
720	2	2100	440	46	40	190	406	160	137